

NOVEMBER • 1946

Vol. 3 • No. 11

Page



LONDON GUARANTEE BUILDING
Michigan Avenue at Wacker Drive
THE HOME OF

finish

MONTHLY TRADE PUBLICATION

Published by

DANA CHASE PUBLICATIONS
360 North Michigan Avenue
Chicago 1
Telephone Central 1229

The only independently published
trade publication devoted exclusively
to Porcelain Enameling and Ceramic
Finishing on metal.

Free controlled circulation to man-
agement, purchasing and key plant
personnel in companies intimately con-
nected with the domestic ceramic
finishing industry. To others, sub-
scription price \$3.00 per year. Foreign
subscription price (U. S. funds) \$5.00
per year.

Editor and publisher, DANA CHASE.
Associate editors, PROF. A. I. ANDREWS
and PROF. R. M. KING.

COPYRIGHT 1946

DANA CHASE PUBLICATIONS
PRINTED IN U.S.A.

THIS WEST COAST PLANT CAN PRODUCE PORCELAIN ENAMELED WATER HEATERS IN QUANTITYBy Gerald E. Stedman	13
FUELS FOR FIRING PORCELAIN ENAMELS — 4th of a Series.....By Prof. A. I. Andrews	17
AN ENAMELERS' FORUM ON PICKLE ROOM EQUIPMENT— Equipment Considerations for Automatic Cleaning and Pickling.....By Nathan Ransohoff	20
Continuous Spray Equipment as Applied to Cleaning and Pickling.....By W. W. Clarke	21
Study the Cleaning Job — THEN — Engineer the Equipment.....By John M. Bash	23
RETAIL MARKET INNOVATION FEATURES PORCELAIN ENAMELED APPLIANCES.....By Gilbert C. Close	26

Features

THE FINISH LINE — An Editorial.....	11
QUICK TRIPS TO ENAMELING PLANTS.....	19
THE SUGGESTION BOX.....	25
SNAPSHOTS AT THE SECTIONAL ENAMELERS CLUB MEETINGS.....	29

Ceramic Finish News

SECTIONAL ENAMELERS CLUB MEETING REPORTS —	
Pacific Coast Enamelers Club.....	28
Chicago District Enamelers Club.....	28
Eastern District Enamelers Club.....	34
THE PEI FORUM REPORT.....	30 & 31
THE WASHINGTON ROUNDUP.....By Wilfrid Redmond	33
AMERICAN GAS ASSOCIATION HOLDS CONVENTION AND EXHIBIT AT ATLANTIC CITY.....	35
INDUSTRY NEWS AND PERSONALS.....	37

Miscellaneous

ADVERTISERS' INDEX.....	60
CLASSIFIED ADVERTISING.....	60

finish

CERAMIC FINISHES ON METAL



PLANT-TESTING Solves Our Problems ...and YOURS!

★ Brother, how wrong you can be if you rely on laboratory tests alone! We know; we've tried it. We still subject PORCELFRIT to rigid laboratory tests, but to make sure . . . to work out all the "bugs" so we *know* what we're talking about . . . we use PORCELFRIT right here in our own job-enameling plant, just as you use it.

That's "plant-testing." That's what gives us the confidence to stand up and tell you that PORCELFRIT is *right*. By making it right for our own needs, we make it right for YOU.

That experience is worth plenty to you. Without obligation, write today for a PORCELFRIT ceramic engineer to go over your operations with you.

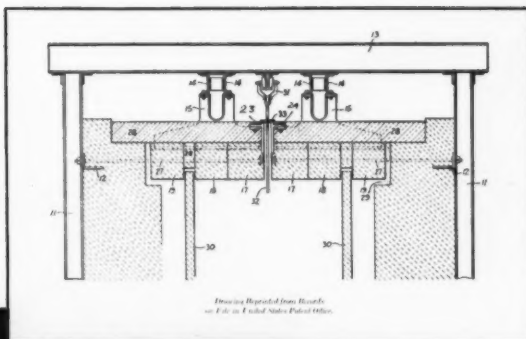


INGRAM-RICHARDSON MFG. CO.
of INDIANA, INC.

Offices, Laboratory & Plant . . . Frankfort, Indiana

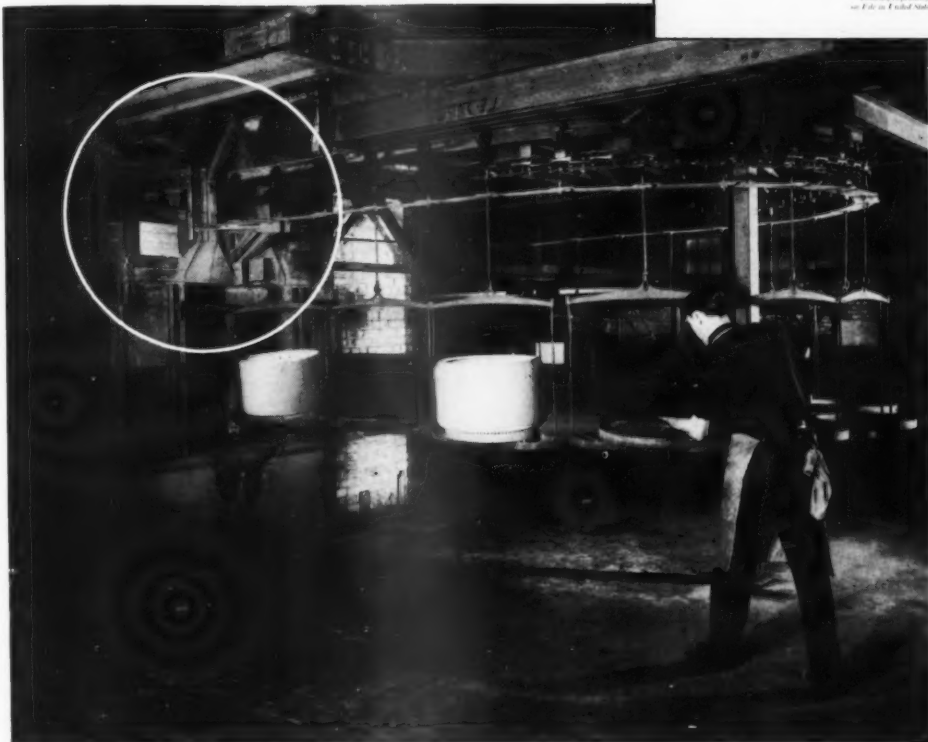
ONLY BOLAND

"Single Flow" Furnaces have "Floating Roof" Construction



THIS REPRODUCTION OF A PATENT DRAWING SHOWS THE PRINCIPLE OF THE "FLOATING ROOF."

TYPICAL FURNACE INSTALLATION AT INGER-SOLL STEEL DIV., BORG WARNER CORP



LOOK to the roof when studying the design of your next continuous furnace. Only Boland furnaces have **FLOATING ROOF** construction, and it's patented. (Boland Patent No. 2,156,008.)

This roof, "built like Gibraltar," not only minimizes heat loss, but offers permanent insurance against conveyor distortion. The accompanying sketch shows the design characteristics of the roof which "carries its own weight." It's sturdily built—for long life.

This feature alone may be important enough to you to specify Boland furnaces, but in addition you get the added features of equalized temperature, heavier furnace loads and the elimination of time and labor consuming "furnace conveyor wrecks" in the Boland **STRAIGHT AWAY**—**SINGLE FLOW** continuous furnace.

BOLAND FURNACES SAVE FUEL. ASK US FOR THE FACTS ON FUEL COSTS.



ALBERT J. BOLAND COMPANY

407 NORTH EIGHTH BUILDING • ST. LOUIS 1, MO.

Designers and Builders of Continuous and Box Type Enameling Furnaces

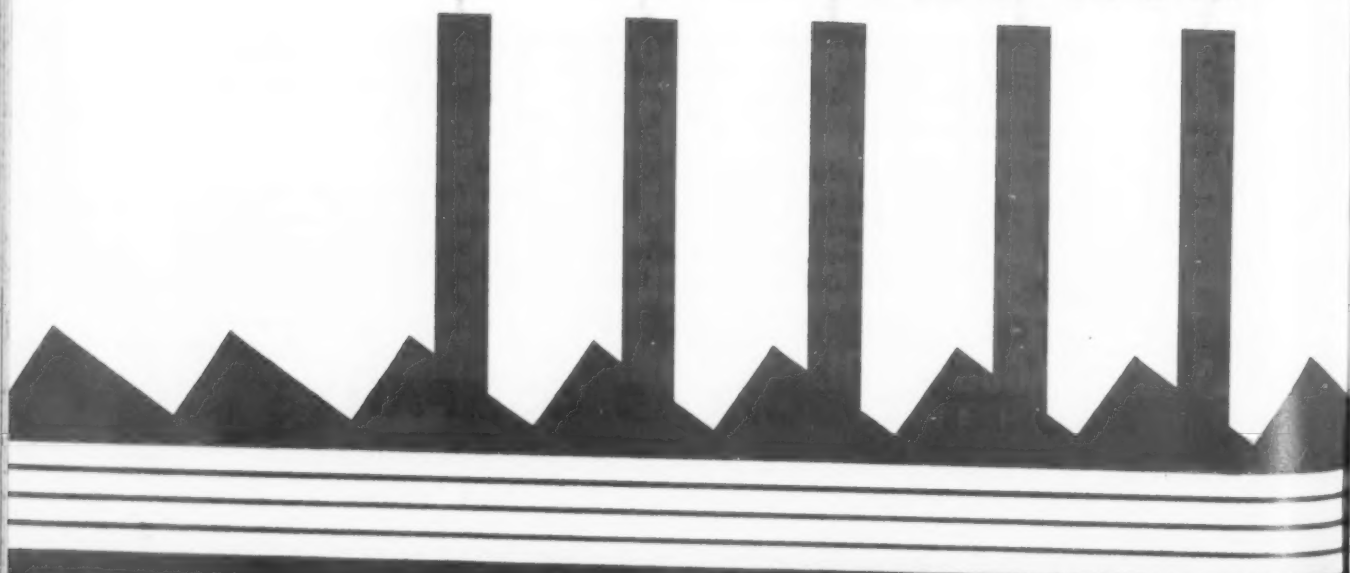
finish NOVEMBER • 1946

CONSISTENT

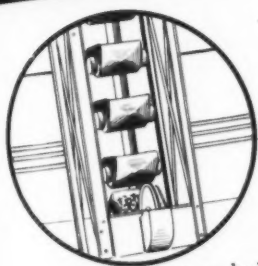
that's only possible
through the CONTINUOUS
process method of
smelting.....

EXCLUSIVE with PEMCO

the World over!



UNIFORMITY



It requires an endless chain of buckets to carry to the dryers endless streams of frit from each Continuous Process Smelter.

No development in the porcelain enameling industry ever created as much interest as the announcement of THE FIRST WHOLLY CONTINUOUS SMELTER by Pemco in 1935. Here, for the first time was a process that removed the hazard of temperature changes in smelting, thus producing a frit so uniform in quality that distance was no longer a handicap to any enameler. He ordered with confidence and with the assurance that his frit would not need constant "servicing".

Pemco NOW has five of these improved wholly continuous smelters running day and night . . . and every day thousands and thousands of pounds of perfect frit, controlled to microscopic accuracy by electronics, are pouring from these smelters for shipment to ALL parts of the world. Because of this Continuous Smelting Process Pemco frits have remarkable qualities of dependability and uniformity of consecutive runs and are extremely adaptable to general shop practice. They produce a finish superior in every way.

We invite you to see these smelters in operation because we believe that then you too will agree that any other method is old fashioned.

PEMCO CORPORATION

BALTIMORE 24



MARYLAND

WITH A GOOD FINISH"

3 MODERN MONARCH PLANTS GEARED TO TOP PRODUCTION



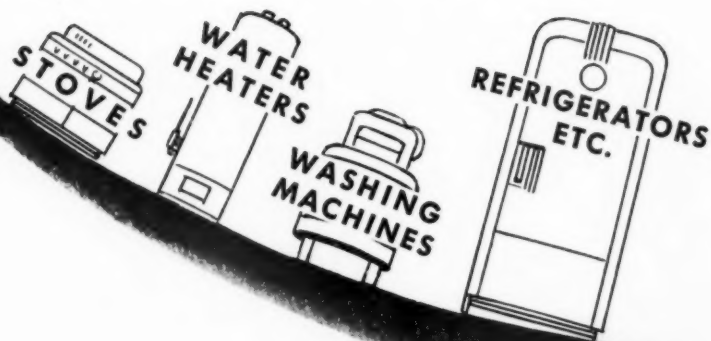
These thoroughly modern, well equipped plants, geared to high speed production, are fully tooled for various kinds of metal stampings, finishing or assembly jobs. All departments are manned by highly skilled craftsmen who, because of their many years of co-ordinated work, make it possible for us to offer you a service that is most efficient and economical — complete from blueprint to shipping carton.

With much newly added equipment, this experienced staff is ready to help you with your production problems. If you have the dies and materials, but are short on production facilities, consult New Monarch today.

STAMPINGS FOR

OUR SERVICE IS MOST COMPLETE

It includes such items as: Engineering, Planning and Developing Your Ideas. Making Dies, Jigs and Fixtures. Stampings Up To 500-Ton Press Capacity. Complete Assembly and Finishing. Painting. Packing and Shipping. These services are available now if you have dies and material.



When you think of Stampings, think of

NEW MONARCH MACHINE & STAMPING CO.

406 S. W. NINTH STREET

DES MOINES 9, IOWA

For **TOUGH** Jobs in Temperature Measurement

Like many high temperature applications, the measurement and control of frit furnace temperatures are best handled by the Brown Radiamatic.

The Radiamatic is fundamentally a compensated radiation pyrometer designed for the service of heavy industry . . . yet as accurate and fast in operation as a laboratory instrument.

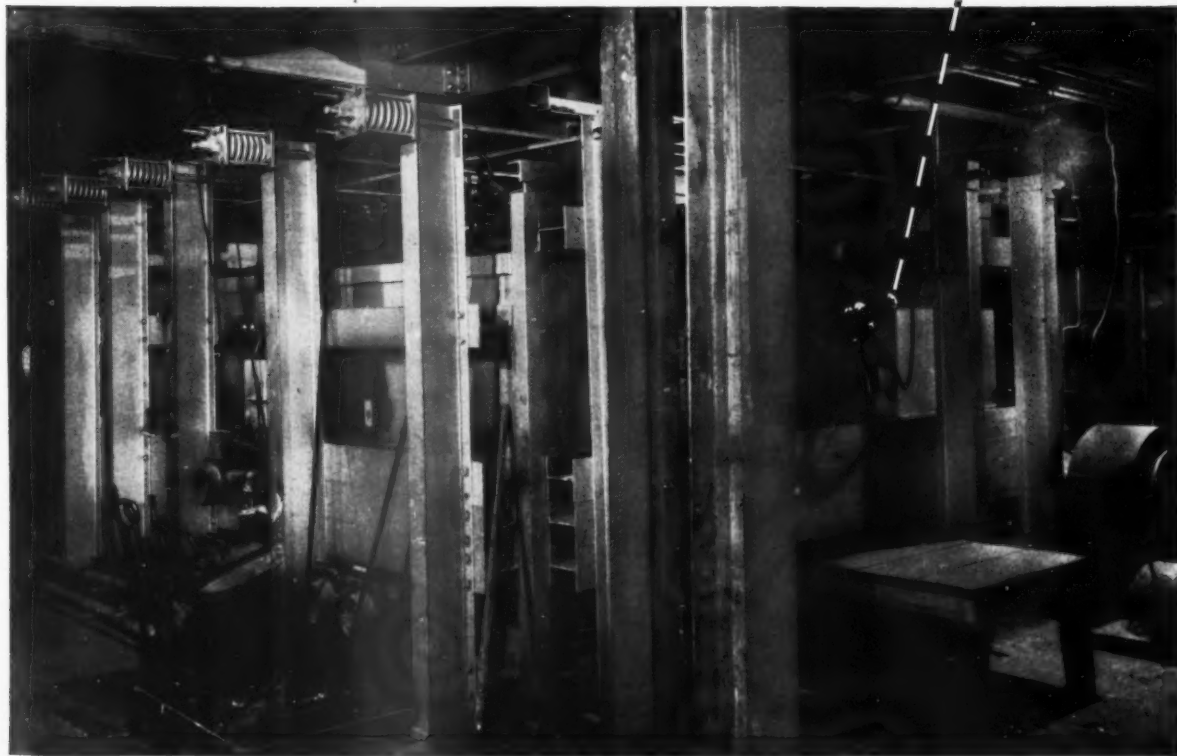
Brown Radiamatics are used on frit furnaces because they are immune to the highly destructive conditions . . . and because they are quick in response to temperature changes. (Actually, a Radiamatic responds to 98% of any temperature change within two seconds.)

The Radiamatic is ideal for measuring temperatures of specific areas — where vibration and shock break the conventional-type thermocouples — where work moves or rotates — where furnace atmosphere conditions are unfavorable — where temperature is above thermocouple range, etc.

Bulletin 5102 which describes the Brown Radiamatic in detail will be sent to you gladly upon request. Write THE BROWN INSTRUMENT COMPANY, a division of Minneapolis-Honeywell Regulator Co., 4411 Wayne Avenue, Philadelphia 44, Pa. Offices in all principal cities.

TORONTO, CANADA
STOCKHOLM, SWEDEN

LONDON, ENGLAND
AMSTERDAM, HOLLAND



BROWN RADIAMATIC PYROMETER

BACKED BY OVER 25 YEARS' EXPERIENCE IN BUILDING BETTER PRESSES

TRADE

Verson

MARK

*the new
Universal
hydraulic
press*

For production - die tryout - die spotting

Built by the originators of allsteel welded construction, the Verson 200 ton Universal Hydraulic Press incorporates all the experience and knowledge that a quarter of a century of press building can pour into one machine. Here are the features that make this a better press:

● **FAST** ... a real producer on drawing, forming and stamping jobs.

● **SENSITIVE** ... for die spotting and die tryout the moving platen can be brought to the work so smoothly that motion is hardly perceptible.

● **SELF-CONTAINED** ... a single compact unit that occupies a minimum of floor space, yet all parts are easily accessible.

● **PLUS THESE EXTRAS** ... cushion equipped ... liberal die space ... adequate stroke for a wide variety of jobs.

Why not plan to put Verson's experience and press building ability to work for you?

VERSON ALLSTEEL PRESS CO.

9320 S. KENWOOD AVE., CHICAGO 19, ILLINOIS



specifications

Distance between housings to clear	72"
Stroke of platen	30"
Shut height, bed to platen, stroke down	30"
Area of platen	36" FB x 66" RL
Area of bolster	48" FB x 72" RL

POWER PRESSES • CLUTCHES • FORGING PRESSES • DIE CUSHIONS • HYDRAULIC PRESSES • PRESS BRAKES

THE Finish Line

A BIG STEP FORWARD — is represented in the accomplishments of the Porcelain Enamel Institute Forum, the eighth meeting of which has just been concluded at the University of Illinois.

Frank Hodek and his Forum Committee deserve the thanks of the entire porcelain enameling industry for the work done in presenting a program of genuine interest and helpfulness to all plant operators and technical men within the industry. Executives of plants operating enameling divisions would feel well repaid for sending their key men to the Forum were they to have the opportunity of sitting in on one of the typical sessions.

The spirit of cooperation and mutual helpfulness evidenced by these men who hold the key to successful enamel plant operation is outstanding.

A change of location

It has been suggested from time to time that as the Forum grows it might be well to schedule it at a hotel or other location that might be more convenient to those in attendance. We urge the continuation of the present plan of holding the Forum meetings on the campus of a university. We attend literally dozens of conventions and meetings during a year, and, in our opinion, there are few that can compare with the Forum in the "strictly business" atmosphere of its meetings and the number of constructive papers and discussions that are covered in a brief three-day period.

There are no "strings" on the activities of the men following the daytime sessions, but the facilities and atmosphere of the meetings held in university buildings unquestionably have a sound psychological effect.

Another milestone

A milestone of unquestionable importance is represented in the announcement by R. H. Turk, Institute president, and Edward Mackasek, managing director, that appliance manufacturers and other product producers who operate porcelain enameling divisions are to be invited into the membership of the Porcelain Enamel Institute. It has often been said that producers of finished

products are not primarily interested in finishes or components of their respective products. We claim that all such manufacturers have an investment of sufficient importance in porcelain enameling equipment, and a sales point of sufficient importance in the finish of their products, that they *are* or *should be* interested in all worthwhile developments within the porcelain enameling industry.

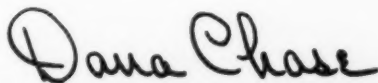
Another point has been expressed by representatives of the so-called "captive" plants — that the Institute, as it is at present constituted, represents only a small fraction of the total production of porcelain enameled ware. It would appear that now there will be a good possibility for eliminating similar expressions in the future.

When the Institute's plan is completed for encouraging the attendance of an executive representative at national Institute meetings and their participation in the group activity, and when additional plant men are encouraged to attend such valuable meetings as the Forum just closed, the resulting benefit will be felt throughout the industry.

One sound idea for increasing plant efficiency will well repay a key plant man and his company for time spent in attending the annual Forum sessions — and an alert man may readily pick up many such suggestions. One good idea for utilizing porcelain enamel as a selling tool in connection with finished product sales and promotion will likewise pay an executive who may represent his company at annual meetings.

A unified industry

This important decision on the part of the Porcelain Enamel Institute should do much toward unification of our industry. With the problems of *every* operating porcelain enameling plant brought into focus at a central point, we can unquestionably make greater strides in materials, equipment and finished product improvement for every one concerned, and the pace at which these strides develop will be greatly accelerated.


EDITOR AND PUBLISHER



"Like U·S·S Vitrenamel-
there's an **EXTRA PUSH** behind it"



SUCCESSFUL enameleers use U·S·S VITRENAMEL Sheets for a number of reasons. In the first place they know that there isn't a better base metal on the market. Secondly, they know that there is prestige behind the U·S·S Label. Thirdly, they get the greater sales and profit value that

accrues to them through the most impressive and consistent advertising and promotion campaign ever directed to consumers for products made from steel. Fourthly, they have the practical help of our marketing and metallurgical specialists in assisting them with any specific

problem which may confront them.

These are the EXTRA PUSH behind U·S·S VITRENAMEL Sheets. These advantages, indeed, are the reason why enameleers and manufacturers of quality porcelain enameled products so enthusiastically have identified their products with the U·S·S Label. They realize that it makes it easier to sell their products, for they know that this label has become a national symbol of quality in millions of American homes.

If you want more information on the EXTRA PUSH, we shall be very glad to supply you with complete details upon request.

U·S·S VITRENAMEL SHEETS

CARNEGIE-ILLINOIS STEEL CORPORATION

Pittsburgh and Chicago

Columbia Steel Company, San Francisco, Pacific Coast Distributors

Tennessee Coal, Iron & Railroad Company, Birmingham, Southern Distributors

United States Steel Export Company, New York

UNITED STATES STEEL

This west coast plant can produce porcelain enameled water heaters in quantity

a new water heater plant with a continuous furnace enameling operation

By Gerald Eldridge Stedman

Exclusive
feature
finish

On assignment by *finish*, I spent several days in Portland, Oregon, during August, particularly to cover the new plant of the Fowler Manufacturing Company, which is turning out porcelain enamel lined water heaters in increasing quantity.

Portland is becoming a great industrial city. Its area population has increased from 26,700 workers in 1939 to 159,517 engaged in industrial activities in 1944. It has less unemployment today than in 1940, among 268 widely diversified metal working concerns. Low cost hydroelectric power, climate, ocean and land transportation advantages, favorable taxation, and raw material sources have attracted 106 new industries since V-J day. There is healthy growth from within, financed by local capital. The Portland area offers real industrial opportunity. For example, analyzing 1939 comparisons in 11 western states, the content of production within the area represented the following percentages of volume of purchase and consumption by the area: agricultural machinery, 7.1; builders' hardware, 18.1; electric appliances, 7.2; refrigerators, 5.8; radios, 9; stoves, ranges and heaters, 54.5 per cent. The fairly high index of the latter probably is due in some part to the production activities of the Fowler Manufacturing Company which have been steadily growing since it built its first electric water heater in Ritzville, Washington, in 1914. Presently, while struggling to procure essential equipment to complete the straight-line flow in its new plant, the company has reached a daily production near-

ing 200 units. Plant capacity should be at 450 units per day at year end.

New plant has U-type material flow layout

The company has been continuously engaged in the production of electric water heaters for 32 years. It consolidated its Spokane and Portland activities within the bright, modern, airy new 60,000 sq. ft. Portland plant in May, 1945. This is serviced by a four-door railway siding the 360' length of the building. Flow through the plant is of "U" nature, receiving from and returning shipping to this siding.

In 1934, Paul L. Fowler, president, completed experimentation on the development of porcelain enamel linings for water heater tanks. Previously, the usual material was galvanized iron with its tendencies to oxidize, corrode, encourage precipitates and scale with attendant objections in fouled plumbing, water sediments, low life and high repair. "Why not make a tank, porcelain enamel lined, like a bath tub?" Fowler asked — and did.

Some thought that internal porce-

lain enameling on steel could not be satisfactorily accomplished. Fowler persisted, and was granted U. S. Patent No. 2,123,169 covering the process. The results were so satisfactory that now Fowler offers a 20-year replacement guarantee policy on the "Porcelined" tank, with free exchange of complete unit for service faults the first three years.

Enameling sheet is received at Fowler sidings, and is brought to the power shears for squaring by electric hoist. The inner tank shell is then rolled, tacked, and seam welded. The work is then annealed in the continuous porcelain enameling furnace, at changed speeds and temperatures.

Tank shells are prestretched

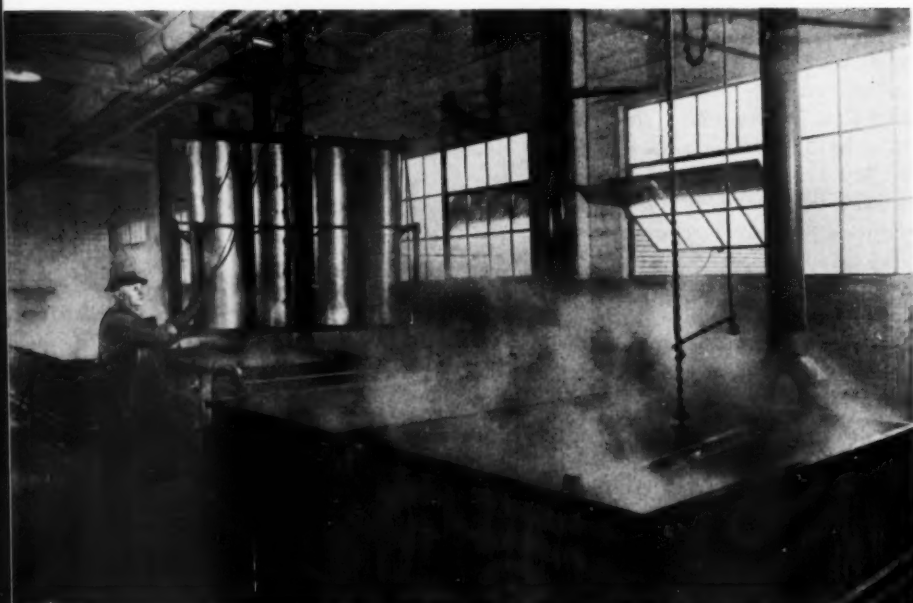
The tank shell, without heads, is then prestretched on the hydraulic hydrotest machine, an original Fowler development that plays a great part in the success of the enameling technique. Pressure is at 450 p.s.i. The prestretching treatment actually evens up the metal, tends to cause changes in grain structure, checks seams, creates a true prestretched cylinder whose inside surface, re-

Personalities that make the operation click include, left to right: J. R. Geddes, plant and production manager; Paul L. Fowler, president; Chester A. Arthur, vice president; F. C. Greenley, superintendent of the porcelain enameling department; and Fred A. Fowler, general sales manager.



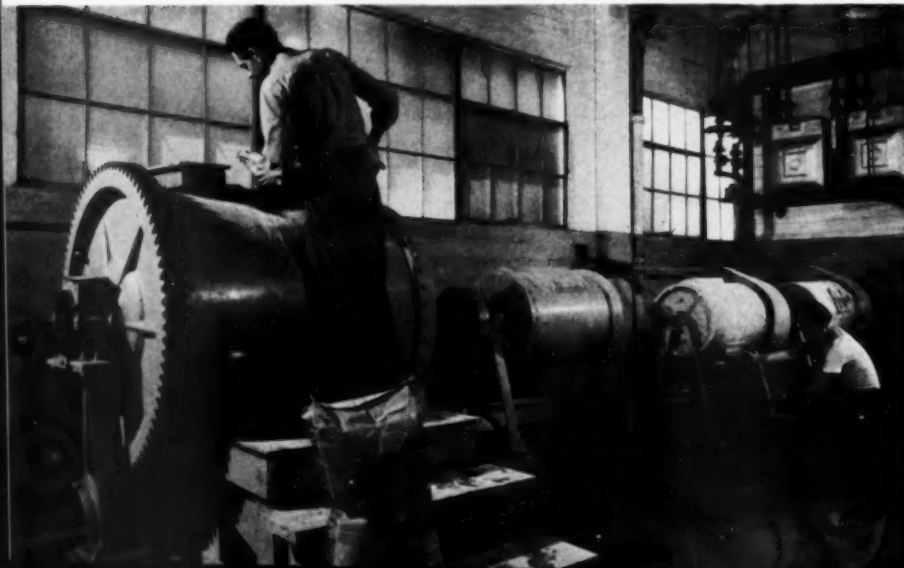


A view through one bay of the Fowler fabricating department.



View in the pickling room showing type of "baskets" used.

View of a corner of the mill room during mill loading operation.



ceiving enamel, has been pre-equalized cold rather than under use-heat. Resultant enameling failures are practically nil.

The headless, prestretched tank shells then go through pickling, serviced by an overhead crane and running through nine tanks — two cleaner, two hot water rinse, one acid, one hot water rinse, two neutralizer. These tanks are heated by gas burners, firing upright, temperatures being between 160° and 220°, pickling layout being in line, and serviced from front aisle. Technique is standard. Unusually good results are secured, probably partially because of the fine quality of Portland water which analyzes, in parts per million: Total dissolved solids 30, SiO₂ 9, Fe 0.03, Ca 2.7, Mg 0.5, Na 3.1, K 0.5, HCO₃ 12.0, SO₄ 3.1, Cl 1.3, NO₃ 0.31, total hardness as CaCO₃ 8.8.

Tank heads are received preformed from outside stamping concerns. Spuds are welded in each head. These are threaded portions that take the plumbing installation. Welds are ground smooth. Spud forgings are produced so that their plus area is not so much different than tank wall thickness to prevent differentials in cooling rate that might cause cracking of the porcelain enamel. Heads are interchangeable, top and bottom. These are pickled and annealed by the same process as the tank shells.

Then follows dipping for the ground coat, brushing, firing, dipping for the cover coat, brushing and firing that I will describe more in detail.

A "streamlined" organization

An aside seems essential. Fowler operates with total absence of what some may term "frills" and has very low overhead costs; having arrived by trial, error and experience at good porcelain enameling results, controls are very simplified. This is a characteristic of its compact management. For example, Fowler handled approximately \$3,500,000 annual volume with only three office girls and a manager. Unusual confidence is placed in representatives of such suppliers as the corporation who built the unusually efficient continuous oil-fired,

full muffle, U-type enameling furnace with a top capacity of 700 tanks per day, and in the two corporations from whom Fowler buys its frits. The mix is developed to get toughness and hardness, plus maximum acid resistance. Color is not a problem since the porcelain enamel can not be seen. The achievement has been to get the proper coefficient of expansion relationship between the steel and enamel.

The porcelain enameling department is in charge of F. C. Greenley, with Fowler five years and, previously for 19 years in porcelain enameling with Montague Stove & Furnace Company, Kenton, Oregon, the company that assisted Fowler in the development of porcelain linings. There are 20 employees in his department.

Fowler maintains four mills, two of them used to grind the mix of frits and chemicals for porcelain enameled signs which Fowler produces in considerable quantity in an auxiliary box-type furnace, electrically heated.

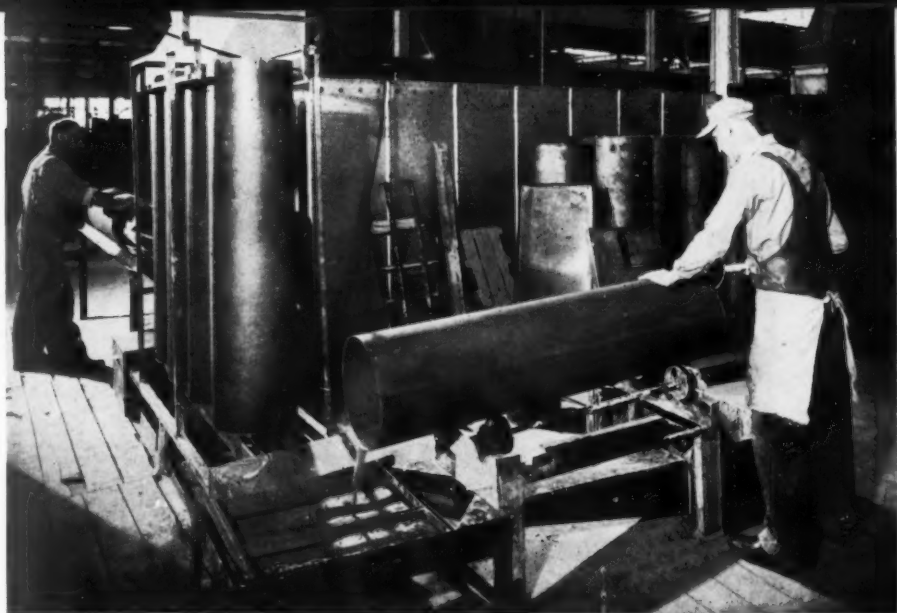
When I was there, Fowler was using a cover coat, the formula per 100 pounds being 6 lb. clay, 4 oz. sodium aluminate, 1 oz. sodium nitrite, and 35 lb. of water, ground to 6-8 per cent on a 200 mesh screen. This provides an acid resisting cover coat having all the impact resistance, hardness and coverage qualities specified.

Mill room control is greatly simplified. Though weight checks of the mix are carefully made, most samplings to gage fineness, specific gravity and toughness are dispensed with. Since the porcelain enameling is an interior lining with no appearance standards to conform to, much of the usual control essential to a visible porcelain enameled surface is considered unnecessary.

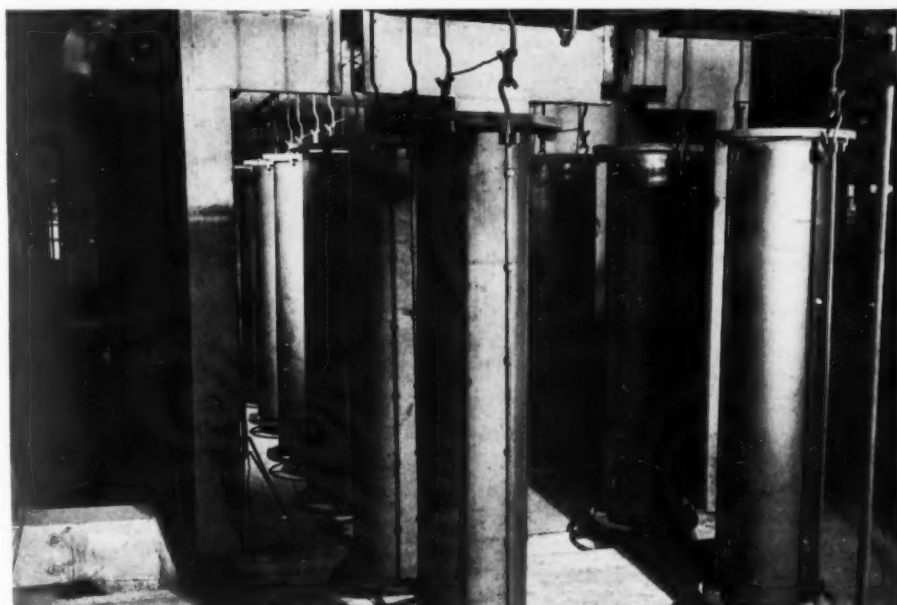
Enamel is "flowed" on

Fowler dipping methods are by gravity flow for both tank linings and heads, and for both ground and cover coats. The wet enamel is simply poured onto the work and permitted to drain off. Tank components are placed on a roller cradle and enamel is poured on their interior surface by hand dipper. Each tank is inclined

finish NOVEMBER • 1946

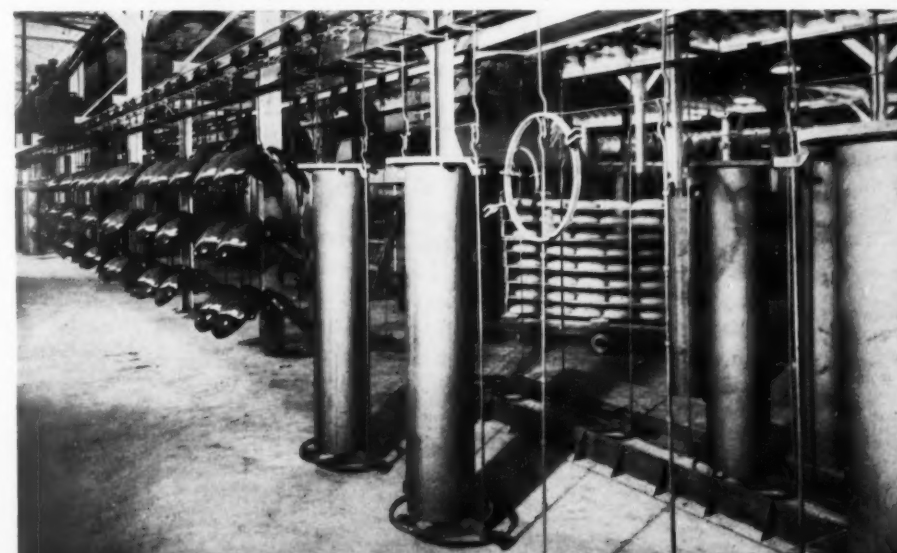


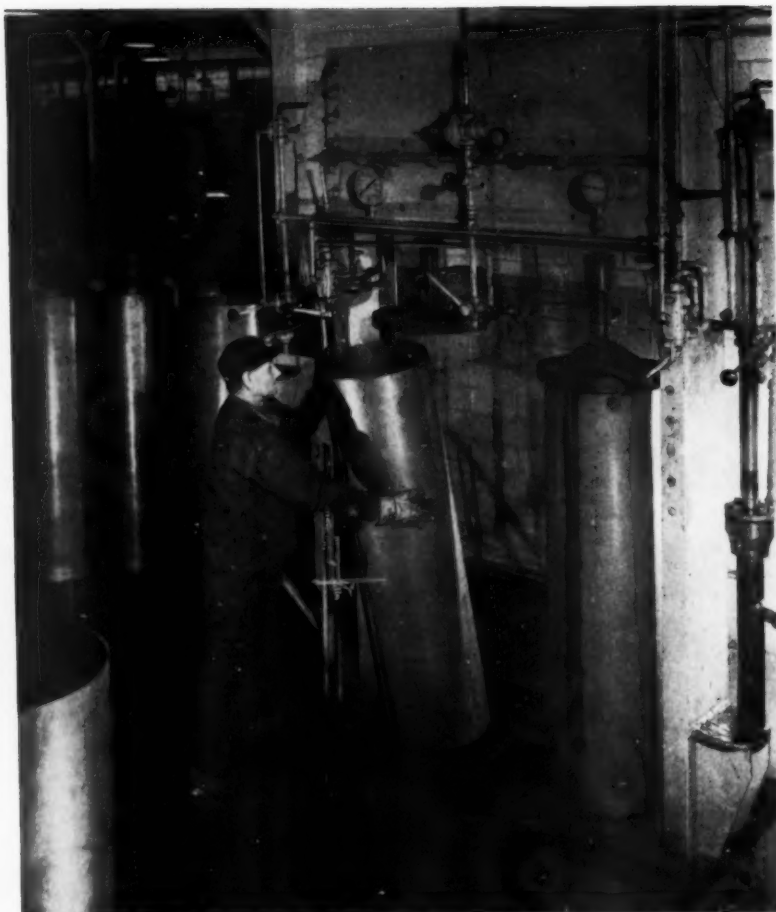
"Flowing" enamel on tank interior. Walking conveyor leads to dryer.



Tanks entering and leaving the "U" type continuous furnace.

View of the furnace conveyor line, taken from unloading station.





Tanks are prestretched under 450 pound hydrostatic pressure.

on this roller cradle 8°. The tank is rolled after receiving the enamel; the excess is drained off by gravity into a dip tank at the cradle foot and returned for subsequent use. Tanks are then uprighted on a walking conveyor. This "walker" operates on an eccentric that advances the uprighted tank a step at a time, and was designed by the company. Tanks receive additional draining as they proceed on this walker and come automatically to be upset onto the platform of the dryer.

The dryer is serviced by a 65' continuous chain moving 4' per minute and is fired by the heat recuperated from operations of the continuous furnace. Drying time is 14 minutes at 300° F. The work runs out from this dryer onto a roller platform and here is brushed to leave a strip for welding on the heads.

Heads are gravity poured over a trough, a paper cap being placed over

spud openings to prevent enamel pouring into their edges. They are then passed through dryer and furnace in exactly the same manner as tank components.

Special burning tools

After brushing, tanks come to furnace loading platform and are hand placed on hanging carrier fixtures of the continuous chain conveyor that services the furnaces. These carriers are circular fixtures forming a bottom rest for the tank and are suspended by a center arm, running through the tank, and hooks above on the conveyor chain. The work proceeds through firing. This continuous conveyor has a total travel of 368'. It moves with variable speeds, adjusted to load and character of work, moving at from 2½ to 8' per minute. Hanging carriers are spaced at 4' centers.

The U-type travel passes through

a preheat of 30', firing 24½', and cooling 21' of furnace travel. Four oil burners are used; two main and two auxiliary sidewall burners. Enameling temperatures are: ground coat, 1580°; finish coat 1540° F. To my knowledge, this is the only continuous furnace in the country built for the enameling of water heater tanks.

After enameling, heads and shells are pressed together in a 60 ft. hydraulic press of Fowler design. Edges are wiped 3/16", with porcelain to porcelain contact for one inch. Heads are then welded to tank, porcelain being tight pressed for the 1" mating. Arc temperatures of the weld are used to soften and fuse this porcelain joint. Fowler has never had a leak reported in these head seams.

The completely sealed tank shell comes along to a rack where it is given soap test under 100 p.s.i. Two nuts are welded topside and 3 nuts bottomsides to accommodate top yoke and base attachments. Fittings are given a water-submerged porosity test at 125 p.s.i. Such plumbing as the copper heat trap and the cold water diffuser are installed through the spuds. The unit is again tested at 90 p.s.i. and the tank is ready for assembly.

The outer shell is composed of 14 parts; head base, three legs, a two-piece shell; head cap, two thermostat wells, and side strips of two pieces each, all fabricated in the plant. The shop is fully equipped with the most modern punch presses, drills, press brakes, spot welders and ingenious jigs. Power hand tools are standard.

Bases, heads and other small parts are paint sprayed and baked in a box-type electric paint oven. The two sections of each shell are cleaned, sprayed and baked on an automatic overhead elevator, conveyor type paint oven. The cycle involves 60 min. of preheat, bake and cooling. Baking temperature is 325° F. The carrier is cam-activated automatically to feed and unload the work from the conveyor. There is 90' of horizontal travel involved in the overhead bake oven, with 18' of vertical elevator loader and unloader.

to Page 52

Fuels for firing porcelain enamels

fourth of a series of six detailed articles on drying and firing procedure

By Professor A. J. Andrews • ASSOCIATE EDITOR

THE selection of a fuel for firing enamels depends upon many factors which involve the fuel cost, the efficiency obtained in its use, and the quality of the fired product. Data on fuel costs are readily available and will not be considered here as the overall cost of firing the ware satisfactorily is far more important. Table IV gives the B.T.U. heat values of the different kinds of fuel. These values represent the heat available in the fuel. A B.T.U. is a British Thermal Unit or the amount of heat required to raise the temperature of one pound of water one degree Fahrenheit.

Coal

It is very difficult to burn coal efficiently and to completely utilize all of the heat available. Coal must be heated to a fairly high temperature before it begins to burn, and even then there must be a considerable mass of coal present to maintain that temperature. The whole combustion chamber must be hot to avoid losing combustible volatiles which are distilled out of the coal. About fifty per cent excess air is even then necessary to approach complete combustion. Smoke is primarily made up of finely divided combustible material which has not been burned in the furnace. The air used to support combustion is made up of about twenty-one per cent oxygen and seventy-nine per cent inert nitrogen. The heat supplied to this nitrogen to raise its temperature is a loss as it is carried right up the stack. An excess of air, therefore, represents a real loss of heat. Heat is further lost in heating the refractories of the large combustion chamber necessary for coal, in the hot ashes, and in the radiation from the fuel door. Ash sometimes causes clinkering which interferes with the circulation of air through the fuel bed and prevents complete combustion of

the fuel. Coal, however, is a low priced fuel as compared with oil, gas and electricity.

Another difficulty in the use of coal is the storage and handling problem. This, however, and the desire to use low grades of coal, has lead to the adoption of mechanical conveyors; large storage bins, and stokers. Gravity, screw and chain-plate feeders are all used with success. Such equipment insures more complete and more uniform combustion and makes it possible to more accurately control the furnace temperature.

The use of powdered coal has not been adapted to enameling furnaces because of the dust hazard. It is, however, a very efficient method for burning coal and is used extensively for rotary cement kilns and boiler furnaces.

Fuel oils

The fuel oils have certain advantages over coal such as ease of handling, storage, and burning. Less excess air is required for complete combustion and the flame can be more readily adjusted to distribute the heat and control the temperature of the furnace. There is generally less smoke and dust when using oil and the combustion chamber does not need to be as large.

There are many different kinds of

fuel oil, varying from the crude natural petroleum to the heavy, medium, and light distillates. These oils are mixtures of hydrocarbons and carry globules of water, asphalt, paraffin, free carbon, and sometimes dirt, which tend to settle to the bottom as a sludge. This sludge is sometimes very troublesome as it clogs the lines and the burners. Screens, sumps, and other equipment such as homogenizers or oil mills are used to either eliminate this sludge or mix it in so that it will flow with the oil. Heaters in the line aid in keeping the oil at a uniform temperature, thereby controlling the viscosity and the rate of flow to the burner.

Fuel oils for enamel furnaces should not contain over 0.5 per cent of sulphur, otherwise the atmosphere within the muffle may become contaminated and the enamel will scum. An oil with a high flash point is preferred to avoid the danger from explosions.

The choice of fuel oil is controlled by such factors as the cost per B.T.U., satisfactory operation in suitable burner equipment, its influence on the up-keep of burner equipment, and sometimes the equipment available. The specifications for the different grades of fuel oils are shown in Table V.

The function of the burner is to

Table IV.
Comparison of Fuels⁽⁵⁾
Amounts of Different Fuels for Equal Heat Units

Oil Gallon	Coal Pounds	Natural Gas Cubic Feet	Coal Gas Cubic Feet	Bituminous Producer Gas-Cubic Feet	Anthracite Producer Gas-Cubic Feet	Total B.T.U.
1.	12.	144	230	986	1035	144000
167.	2000.	24000	38400	164000	173000	24000000
6.95	83.5	1000	1600	6850	7180	1000000
4.34	52.1	625	1000	4280	4500	625000
1.02	12.2	146	235	1000	1055	146000
.97	11.6	139	222	953	1000	139000

Table V.
Fuel Oil Specifications⁽⁶⁾
Requirements for Fuel Oils, 1, 2, 3, 4, 5, and 6

Grade	Flash Point		Water and sediment, maximum	Pour point maximum	Viscosity maximum
	Minimum	Maximum			
No. 1 (A distillate oil for use in burners requiring a volatile fuel).	110° F. or legal	165° F.	0.05	15° F.	
No. 2 (A distillate oil for use in burners requiring a moderately volatile fuel.)	125° F. or legal	190° F.	0.05	15° F.	
No. 3 (A distillate oil for use in burners requiring a low viscosity fuel.)	150° F. or legal	200° F.	0.1	15° F.	(Saybolt universal at 100° F. 55 seconds)
No. 4 (An oil for use in burners requiring low viscosity fuel.)	150° F.	250° F.	1.0	15° F.	(Saybolt universal at 100° F. 125 seconds)
No. 5 (An oil for use in burners permitting a medium viscosity fuel) (Bunker B, Fed. Spec., 2nd.)	150° F.	—	1.0	—	(Saybolt Furol at 122° F. 100 seconds)
No. 6 (An oil for use in burners permitting a high viscosity fuel.) (Bunker C, Fed. Spec., 2d)	150° F.	—	2.0	—	(Saybolt Furol at 122° F. 300 seconds)

Table VI.
Analyses of Gaseous Fuels
Properties of Gaseous Fuels

	Natural Gas	City Gas	Producer Gas
Methane	83.5	14.8	2.6
Ethane	12.5		
Nitrogen	3.8	1.8	58.8
Ethylene		12.8	.4
Carbon monoxide		33.9	22.0
Carbon dioxide		1.5	5.7
Hydrogen		35.2	10.5
B.T.U. per cu. ft.	1047	578	136
Theoretical Flame Temperature °F.	3740	4090	3050
Cu. ft. of air per cu. ft. gas	10.04	4.85	1.08

Table VII.
Factors in the Selection of Fuel

1. Fuel cost	9. Amount of suspension required
2. Fluctuations in fuel cost	10. Ease of temperature control
3. Dependability of fuel source	11. Furnace atmosphere problems
4. Fuel storage and handling	12. Neighborhood problems
5. Furnace costs	13. Dirt and enamel contaminations
6. Burning equipment costs	14. Plant capacity
7. Refractory costs	15. Kind of ware to be fired
8. Repair costs	

(5) *Ceramics Products Cyclopedia*, 6th Edition, Industrial Publications, Inc., Chicago, Ill.

(6) *Hansen, Manual of Porcelain Enameling*, Ferro Enamel Corporation, Cleveland, Ohio.

completely and uniformly atomize the oil and deliver it and the air into the combustion chamber in proper proportions. Very little, if any, excess air is required to completely burn the oil if it is thoroughly atomized. Oil in globules will only partially burn even in excess air and will appear as incandescent particles of soot in the flame.

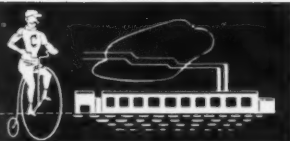
Gaseous fuels have advantages over both coal and oil for heating enameling furnaces. They are clean, easily controlled, the heat can be distributed by multiple burners, and they can be adjusted to give a long or short flame as desired. The simplest arrangement for a gas burner is one in which the gas and air orifices are designed and adjusted so that the flow of the gas draws in the necessary proportion of air to give good combustion. No atomizing or mixing is necessary.

In many cases, however, it is considered worth the added expense for equipment to insure perfect control of the combustion by proportional mixing. With this equipment the gas and air are controlled by proportioning valves which are balanced against each other. With this system a single lever will increase or decrease the gas and the air to raise or lower the temperature always with perfect combustion. An automatic temperature controller can, therefore, adjust the lever and make the furnace completely automatic. The great advantage of gas as a fuel is the facility of this gradual change in the heat supply. Table VI gives analyses of different typical gaseous fuels.

Electricity

Electricity as a source of heat has many advantages over all of the different types of fuels but it has the one disadvantage of high cost. Electricity eliminates muffle and nearly all other refractory troubles. None of the refractories are heated to excessive temperatures and they are not subjected to sudden changes of temperature. Products of combustion can not contaminate the furnace atmosphere and the heat in the furnace can be distributed wherever it is needed.

to Page 25 (Column 3) →



A visit to Ingram-Richardson Mfg. Co. of Indiana



Proof that the president works too. Ray Coin at his desk.

Center: Spraying ground coat on sinks at the Ing-Rich plant.

Bottom: Sinks enameled in cover coat enter the gas-fired continuous furnace for fusing.

finishtotos

are placed on the spraying conveyor horizontally, with the front flange at the top. Ground coat is sprayed, and the conveyor then takes the parts through a gas fired drier. The tops and bowls are transferred to the furnace conveyor where they are suspended vertically for fusing in a U-type, gas-fired furnace. Ground coated parts then get a rigid inspection and are transported to the cover coat spray area on a ceiling conveyor. Here the tops and sinks are laid horizontally on the cover coat spray conveyor and the first coat of white is applied. After drying, all faucet holes are brushed with an air brushing gun, the first coat white is fused and the ware again inspected.

The final acid resisting white coat follows the same routine as half

to Page 48 →

A RECENT motor trip through Indiana brought us to the Ing-Rich plant at Frankfort, a much changed plant since the last time we visited. The company is completely reconverted from war operations, has added a third continuous furnace to its firing facilities, and is in worth while production on a variety of porcelain enameled products.

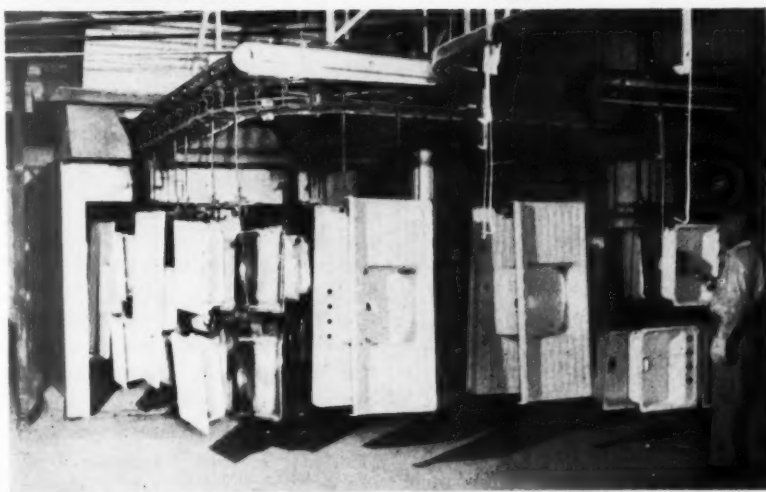
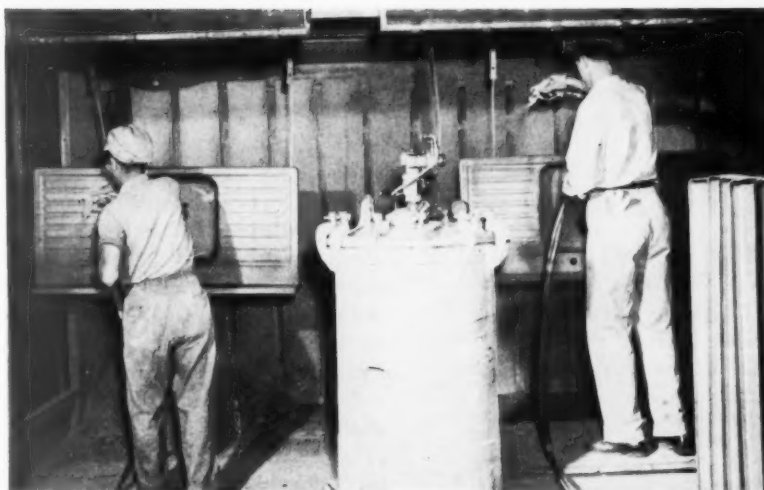
After a visit with President Ray Coin, Jack Hurd took us through the complete plant for a quick once-over. We met H. D. Eggers, assistant general sales manager, who takes candid photographs as a side line, and dropped in to see Clark Hutchison, director of research for the company and a loyal booster for "Dear Old Illinois."

Tom Schooley, enameling foreman of sinks, showed us through the new production line which was going full tilt on porcelain enameled steel sinks.

A bit about sink production

After the sink tops and bowls are formed in the metal fabricating department, they are conveyed to the pickling department for metal preparation. Features included in the pickling setup are nickel dip and a recently installed filter unit for cleaning solutions.

After pickled parts are dried, they



Equipment considerations

for automatic cleaning and pickling

a case for the "grasshopper" type machine for continuous pickling

By *Nathan Ranschoff* • PRESIDENT, N. RANSCHOFF, INC., CINCINNATI, OHIO

IN discussing any automatic cleaning and pickling operation, the first thing to consider is the number of different processes through which the work has to go; time required in each tank; and the nature of the acid or other solution in each tank. For example, one of the simplest combinations of cleaning and pickling is the cleaning of aluminum forgings. These must be etched to remove the graphite and lubricant which is burned onto them in the dies. This requires a 4 min. hot caustic solution, 1 min. hot rinse, 2 min. cold nitric acid solution, and 1 min. hot rinse. A processing job of this nature can be most easily performed in a conveyor type machine with the solutions being flooded onto the work. Flooding in this case is low pressure, low velocity, and relatively high volume. The reason this can be comparatively easily done in a conveyor machine is that 18.8 stainless steel is resistant to nitric acid, and the caustic etching section of the machine can be made of mild steel.

One of the main difficulties in the operation of a machine of the type described has been pump maintenance, due to the difficulty of securing a pump packing that will stand up to a strong hot caustic solution. This difficulty was eliminated by designing and building a vertical packless pump with the impeller and casing in the solution. With a machine of this type, in order to keep the initial cost of the machine down, the design is such that the conveyor chains travel on the outside of the housing which makes it possible to use standard steel chain rather than stainless steel. The cross bars of the conveyor are made of stainless steel. Since the processing times are relatively short, the length of a straight

conveyor machine will not become excessive.

After we leave this simple process, the construction of a spray pickling machine becomes more complicated, higher in maintenance, and the use of either a dipping unit or a combination spray and dipping unit would be indicated for the following reasons:

1. The metals are much more subject to attack by both sulphuric acid and hydrochloric acid when these

acids are aerated or sprayed. This was brought out during the war in the maintenance records of spray pickling machines. The metals that would give perfectly adequate service when used as tanks or pickling crates went to pieces in a relatively short time when used in the construction of spray pickling machines.

2. The acids themselves, both sulphuric and hydrochloric, were found to deteriorate very rapidly when sprayed.

3. If there are a relatively large number of processes through which the work has to go, and these processes each require several minutes, the length of the conveyor machine will become excessive because the work must go through in a single layer or single line. This means a high speed on the conveyor and, consequently, a greater length of each section to allow the proper time in each process.

The "grasshopper" type machine

We recommend what we call a "grasshopper" machine for this type of work. In this grasshopper machine, the work is loaded into crates

or hung from fixtures. The crate or fixture, after loading, is hung onto the conveyor chains of the machine at the charging end and advances automatically through the various processes. Since you can get a large amount of work into a crate without taking up much surface area, the capacity of the machine is a great deal larger than a conveyor machine of the same length. For example, a typical series of stages for pickling for porcelain enameling might be: 5

min. caustic wash, 5 min. second caustic wash, 30 sec. hot rinse, 30 sec. hot rinse, 4 min. pickle, 4 min. pickle, 30 sec. cold rinse, 30 sec. hot rinse, 5 min. nickel dip, 30 sec. hot rinse, 2 min. cyanide dip, 30 sec. neutralize and dry. In this case, the conveyor of the machine advances every 30 seconds, and the machine is so designed that as each crate comes to the end of the tank it is automatically lifted and transferred to the next tank so that in the stages requiring 30 sec. the work goes into the tank on one move of the machine and goes out on the next move, and for a stage requiring 4 min. the work would remain in the tank for 8 moves of the machine. In other words, this tank would have to be 8 times as long as the crate, plus clearance for in and out. The in and out movement is vertical, which reduces the clearance to a minimum.

If spray wash is required, this can be performed in any of the tanks by merely introducing a pump and spray heads around the wall of the tank. Furthermore, agitation can be supplied by giving the track on which

to Page 22 (Column 3) →

Continuous spray equipment as applied to cleaning and pickling

data based on shop application of continuous spray equipment

By W. W. Clarke • GENERAL MANAGER, METALWASH MACHINERY COMPANY, IRVINGTON, N. J.

THE development of continuous spray equipment for the cleaning and pickling of metal parts prior to porcelain enameling is the result of nearly ten years of research and experimentation on a number of the factors involved.

During 1937 we were asked by one of our customers to design a power washing machine for parts prior to enameling. This machine was quite successful so far as the cleaning was concerned, but left much to be de-

by spraying sulphuric acid; whether a deposit of nickel could be obtained by the same spray method; and, finally, the necessity of finding suitable materials for the manufacture of the pumps, tanks, piping, and other essential parts of the machine that would stand up under this service without excessive maintenance.

Although the first machine which we built was of the flat belt type, the overhead conveyor type was finally selected as being the most flexible for

this experience giving us the answer to our previous difficulties in trying to deposit nickel.

The machine and its parts

The continuous spray pickling machine or equipment as it has evolved consists essentially of a tunnel equipped with an overhead mono-rail conveyor and having the various solution tanks, pumps, piping, etc., arranged beneath it in proper sequence.

The tunnel is, of necessity, quite long but does not have to be built in a straight line. It is entirely possible to have it in the form of an "L," "J," or "U"; or, if suitable conveyor arrangements can be worked out, it can be a double tunnel with two lines of work moving simultaneously through the successive stages.

The hooks or hangers for the ware are of monel, while the conveyor chain is of ordinary steel construction. These hangers extend through a slot in the tunnel roof and are equipped with either single or multiple hooks upon which individual parts may be hung, or monel carriers or baskets may be hung from one or more hooks in order to obtain a suitable arrangement of the parts and to get maximum production capacity.

The length of the unit is, of course, closely tied in with the size of the parts and the production required, and it generally requires a very careful study of the method of loading in order to obtain the maximum production with the minimum conveyor speed.

It is obvious that if production requires a conveyor speed of 5 feet per minute, and the treatment cycle is 27 minutes, the length of the machine will then be 5 x 27, or 135 feet long. Using a double tunnel machine would reduce the chain speed 50% to 2½

PICKLE ROOM EQUIPMENT

sired — as we found out when we tried to sell it to other concerns in the porcelain enamel industry. It soon became obvious to us that there were a number of other factors involved in the preparation of enamelware besides the preliminary cleaning, since the use of a power washer, while giving an excellent cleaning job, actually increased the amount of labor required in the entire cleaning and pickling cycle.

Developing a unit for the complete cleaning and pickling cycle

We then began to think in terms of a complete unit that would perform the entire cleaning and pickling cycle from the finish of fabrication to the application of the ground coat enamel, without any intermediate handling. There were a number of serious obstacles to the development of such a unit, among them being the development of methods of hanging and racking that would insure complete coverage, drainage, and cleaning of the parts, and at the same time enable them to be easily loaded and unloaded; whether or not a good etch could be obtained upon the steel

hanging all different shapes and kinds of parts, with the further advantage that it reduced the number of moving parts in the various spray compartments to a minimum.

We set up an experimental spray washing machine in an enameling plant and ran a great many tests on the spraying of nickel sulfate — trying various concentrations, pressures, temperatures, types of sprays, etc. The results of these tests were not too encouraging; we did deposit nickel but the deposits were spotty and varied considerably from one part of the ware to another. We then went into the matter of materials and finally designed a machine for the entire cycle.

At the outbreak of the war, we were asked to develop automatic spray pickling equipment for use with artillery cartridge cases and a number of other items, and built a large number of these machines; and, in the process of doing so, developed suitable materials for both the acid and nickel sulfate solutions. We also gained considerable experience in the deposition of copper on pickled steel by means of spraying copper sulfate,

feet per minute and still give the same production, but the over-all length would only be reduced about 30% to approximately 95 feet, since some parts of the unit can not be shortened, regardless of the conveyor speed. Conversely, if the 135-foot machine were to be made a double tunnel unit, at the same speed of 5 feet per minute the production could be doubled at only a moderate increase in the first cost of the machine.

various solutions impinging upon it from all angles.

While we are working on a number of these units, the only one in actual operation to date is the one at Landers, and our operating costs and data have all been obtained from this source. It is their practice to dump their cleaning tanks once a week and add daily makeup as may be required. The pickling tank is never dumped, since the carry-in and carry-

down the sludge formation. When the filter is installed it should then be possible to maintain the solution indefinitely with regular additions to compensate for drag-out losses.

The neutralizing solution is not filtered and it is necessary to dump same every day, as it gets rather dirty. Filtering would, of course, eliminate this, but at the low cost of soda ash and borax there is some question as to whether it would be worth the cost of installation.

TIME AND TEMPERATURE SCHEDULE

	CONCENTRATION	TEMPERATURE	TIME — MINUTES
(a) Emulsion cleaner	1 : : 50	180° F.	1
(b) Water rinse	—	Cold	1/3
(c) Alkali cleaning	1 oz./gal.	180° F.	1
(d) Water rinse	—	Cold	1
(e) Sulphuric acid pickling	—	160° F.	2
(f) Water rinse	—	Cold	1
(g) Nickel solution	—	175° F.	2
(h) Water rinse	—	Cold	1
(i) Neutralizing	3 oz./gal.	180° F.	3/4
(j) Air blast drying	—	220° F.	4

A machine such as this will handle approximately 3,000 square feet of ware per hour, or 24,000 square feet per 8-hour shift; the parts consisting of washer tubs, covers, stove parts, etc.

In figuring square footage of ware handled, it is our practice to consider both sides since we treat both, even though only one side may later have a finished coat of enamel.

The above figures are taken from the installation at Landers, Frary and Clark Company in New Britain, Connecticut, although this machine is at the present time only running at about 60% of the above capacity, or approximately 19,000 square feet per 10-hour day, due to the type of steel obtainable and the consequently longer pickle time required.

Operating data

The cycle of chemical treatments through which the work passes is essentially the same as in the tank method except that all solutions are sprayed and the times, temperatures and concentrations are usually much lower.

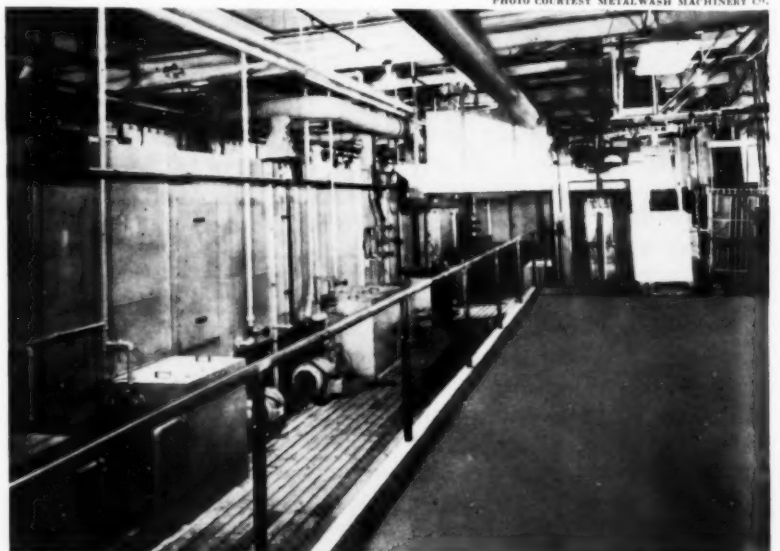
All treatments are by the spray method, the ware being subjected to the combined mechanical and chemical action of jets or sprays of the

out prevent the iron content of the solution from rising to a point where it would interfere with the pickling, and it is only necessary to add approximately 25 gallons of acid per day to the tank.

On the nickel sulfate, due to the fact that a filter has not as yet been installed, it is necessary to dump the tank every two days in order to keep

This continuous spray machine, used for cleaning and pickling parts prior to porcelain enameling, is installed in the plant of Landers, Frary and Clark Company, New Britain, Connecticut.

PHOTO COURTESY METALWASH MACHINERY CO.



Equipment considerations..

(RANSOHOFF)

→ from Page 20

the chain travels an up and down movement.

During the war these machines were used for pickling shell cases, and we ran into the problem of trapping air and drainage of shells that were closed on one end. This problem was solved by equipping the racks with an attachment to turn them part way over so that they went into the solution with the open end of the shell up and left the solution with the open end of the shell down. This same method in handling crates might come in very handy in pickling kitchenware, such as pots, pans and cup-shaped work.

Study the cleaning job

- THEN - engineer the equipment

a bit of advice in a general article on metal cleaning
keyed to both ceramic and organic finishing plants

By John M. Bash • PRESIDENT, PHILLIPS MANUFACTURING COMPANY, CHICAGO, ILLINOIS

WHEN the most suitable material and methods have been determined, it is always possible to design a machine which will be effective for that combination of material and methods.

The fact that a machine can be designed to handle any particular cleaning problem does not necessarily mean that a machine is inevitably needed. Whether or not a machine is needed is entirely dependent upon the output required by the production schedule. The production schedule may not warrant either a fully automatic or a semi-automatic machine. It may be adequately handled by a properly arranged series of tanks with or without material handling devices.

Selecting the cleaning material

Let us consider a number of factors which chiefly affect the selection of cleaning materials and methods. First, the condition of the part to be cleaned—there are varying degrees of dirtiness. Many parts have only a light deposit of dirt. Such deposits can be removed by methods and materials which would be unsuitable for heavy deposits. Heat or pressure present during the working of metal often materially increases the difficulty of dirt removal. Secondly, it will, of course, be understood that the word dirt covers any material which must be removed from the metal. The range of materials thus included is extremely large and the importance of a clear understanding of the nature of the specific material to be removed can not be over-emphasized. Many materials which respond readily to certain types of cleaners are not touched by other types. For example, the cutting lubricants, coolants, drawing and stamping compounds, polishing and buffing

compounds and similar materials used in processing metals vary widely in their constituents. It is not enough to know that a drawing compound or a coolant must be removed; it is essential that the basic ingredient of the lubricant or coolant be known,

are far from satisfactory. Almost invariably an investigation will show that a change has been made in a lubricating compound, the buffing or polishing material or some similar sort of dirt which has introduced a new ingredient not compatible with the old cleaning method.

The removal of solid particle dirt presents one of the most difficult phases of any cleaning problem. This is particularly pertinent when the object is going to be painted immediately after the cleaning process. Many times it becomes the deciding factor as to whether an alkali type of washer or a chlorinated hydro-carbon solvent degreaser is to be used in the cleaning process. In addition to the nature of the dirt, there is the equally important question of the degree of adherence it has to the metal surface. At one end of the scale you have dirt which might be compared to the effect you would get if you rolled a clean piece of metal on the floor. There would be practically no adherence of such dirt to the metal and it could be washed off by simply dipping.

On the other extreme, take the example of "smut" on steel. Here we have an extremely difficult dirt to remove, which responds, in fact, to very few cleaning materials. In between these two extremes there is a wide variety of degree of adherence. Whether an alkaline, chlorinated hydro-carbon solvent, acid or emulsifying cleaner is best suited to any cleaning operation is frequently governed to a large extent by this factor of adherence.

The degree of cleanliness

Next, let us take up the degree of cleanliness desired. There is a considerable difference in the degree of cleanliness required, which is a very

Editor's Note:

One of the best signs of general industry improvement in porcelain enameling plant facilities is the transition of the pickle room from the darkest corner of the plant to its proper place in the production line commensurate with its importance in enameling practice. In the new plants, and in many rehabilitated plants, the pickle room, whether a manually operated, open tank setup or a continuous machine, is given its proper relative importance.

Current interest in cleaning and pickling procedure is demonstrated by the fact that the majority of the papers presented at recent sectional Enamellers Club meetings were on the subject of cleaning, pickling and pickle room equipment.

The three papers representing "An Enamellers' Forum on Pickle Room Equipment" in this issue were adapted for finish from presentations before the Chicago and Eastern District meetings. Some of the information covers a broader field than porcelain enameling, but it is felt that all enamellers are interested in the general subject of metal preparation.

A fourth article on metal preparation, with illustrations, will appear in a later issue.

in order that the proper cleaning material may be selected. Possibly, this information may not be obtainable. If that is the case, then suitable tests should be made to determine the ability of various available cleaning materials to remove such compounds. It often happens that a cleaning operation which has been satisfactory for years suddenly goes sour. The same cleaner, the same method, the same equipment are in use, but the results

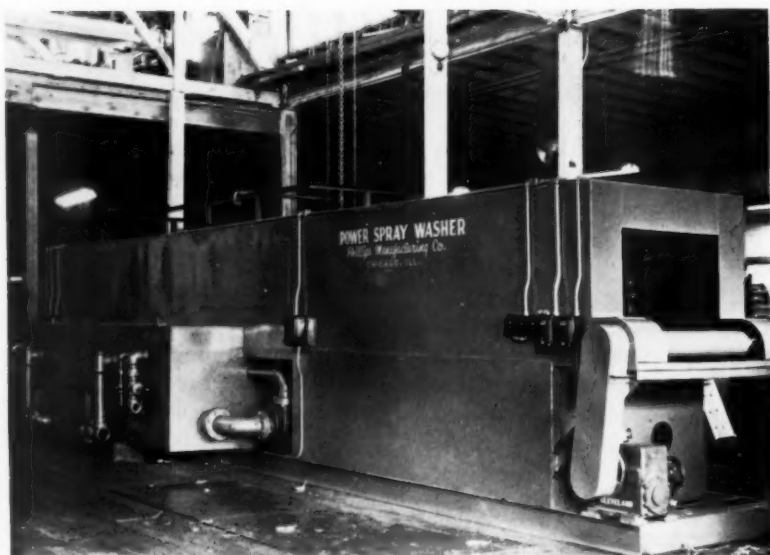


PHOTO COURTESY PHILLIPS MANUFACTURING CO.

An alkali power spray washer of the type discussed by Mr. Bash.

important factor in the selection of methods and materials for metal cleaning. Cleaning prior to painting or lacquering usually requires a physically clean surface. This means that all gross surface dirt has to be removed. Cleaning prior to vitreous enameling or electroplating demands a chemically clean surface from which all traces of oil or grease have been so thoroughly removed that a water break does not occur and from which all solid particles of dirt have been disengaged, oxides or rust and varnish removed, and even to some degree absorbed gases displaced. Then again, there are some cleaning operations which do not have to proceed even as far as physically clean surface. For example, inspection, assembly or the rough painting of machinery can be safely and satisfactorily undertaken on surfaces which are only relatively clean. Therefore, the selection of methods and materials is very much dependent on the degree of cleanliness required. As I mentioned before, the kind of cleaning material to be used often affects the design of the cleaning machine. Generally speaking, there are five major classes of materials for use in the metal cleaning field. No. 1 is your alkaline cleaner; 2, your chlorinated hydro-carbon solvent cleaner, usually called the vapor degreaser; 3, petroleum spirits; 4,

emulsifiable cleaners; and, 5, acid cleaners. It is often possible to adapt existing machinery to different kinds of cleaners, sometimes with relatively simple changes.

The kind of metal

Now let us take up the kind of metal to be cleaned, which also greatly affects the selection of the cleaning material. In fact, it affects the selection of the cleaning material far more in many cases than it does the design of the cleaning machine. Therefore, the choice of cleaning material, made by proper weighing of the factors mentioned, may be radically affected by the action of the material on the metal. For example, strongly caustic cleaners may be indicated because of the degree of dirtiness, the nature of the dirt and the degree of cleanliness required. However, they could not be used on aluminum, brass or zinc because of the corrosive or tarnishing action of such cleaners which might, under certain circumstances and conditions, effect a serious etching or discoloration. Here, however, the emulsifying cleaner or the vapor degreaser would fit in more readily because it has no harmful effects on any metal.

The performance test

In view of the many factors which govern the selection of an effective

and economical alkaline cleaner, particularly when vulnerable metals and difficult rinses are involved, there is really only one safe criterion for the ultimate decision. This is to run performance tests on the work to be cleaned, under simulated conditions which are as close to those at the actual plant as possible. Naturally, when tests can be run right at the plant, this is the best method to use.

Falling back, for a moment, to the various types of metal surfaces desired, let us say that a manufacturer is merely desirous of removing some sort of lubricating compound. This is a relatively simple problem and is easily solved as there are innumerable types of alkaline cleaners which will do the job satisfactorily. Next, let us say that the manufacturer is desirous of running through some sort of steel fabricated part in which painting is the next step. Here he needs a relatively clean metal surface. If his parts are run through a conveyorized washer, using the proper type of chemical compound in which a satisfactory amount of wetting agent has been introduced, he will get a clean part. The proper type of wetting agent in any alkaline cleaner is very important as it goes a long way to insure proper rinsing. If, in the third case, the manufacturer desires to plate his part or vitreous enamel it, then after the part is removed from his cleaning machine, he must go a step further and get a chemically clean surface.

A chemically clean surface is one which has been cleaned of all impurities and on which a water break will not occur. After the part has been run through a power spray washer, it must then be introduced to an electrolytic cleaning tank. Cleaning electrolytically will leave the metal in the correct condition to be plated or vitreous enameled.

Emulsion cleaners, which are becoming more popular each day, have the primary advantage of comparatively low overall costs, plus freedom from any danger of attack on any type of metal, and they also have a very general utility purpose. They are usually cut with anywhere from

to Page 54 →



SUGGESTION BOX

A transfer system for a monorail conveyor

a suggestion by R. S. DALE, Ervite Corporation

IN order to most efficiently serve our furnace with the shop monorail, it became desirable to elevate the track in the vicinity of the fur-

nace forks. This provided proper working height of the carriages for loading and unloading the hanging setups, and also permitted the car-



Transfer system with air operated lift for changing conveyor level.

finishfotos

Walking beam lift as it starts to raise conveyor to higher level.



riages to clear the forks, so that a through track could be provided across the forks back of the hanging setups and for access to a track between the forks. The problem was how to elevate the carriages from the shop track level to the furnace track level, about two feet, without expensive elevators.

Utilizing the walking beam principle, with a curved beam and a simple air lift with control handles at a convenient level, we accomplished our solution simply and at modest cost. The track is hinged at the upper level, and the lower end is raised by cables running over sheaves, powered by horizontal air pistons located above the rail supports. The transfer carriages are rolled onto a flat section of elevator rail at either the upper or lower level. The beam is then lowered or raised by the air hoist at such a speed that the carriage glides smoothly over the curved section of track from one level to the other. The position of the rail acts as an automatic stop to keep wheels from running off the upper level, and automatic stops are provided at the track end on the lower level.

Finish will pay a minimum of \$10 for each idea printed in the Suggestion Box. Send your suggestion now.

Fuels for firing porcelain enamels

(Continued from Page 18)

Cooling and reheating of the furnace does not severely strain the refractories and the control of temperature must be automatic. There is much less danger of dust and dirt falling from the refractory or the atmosphere in an electrically heated furnace.

It is obvious that the selection of the type of heat to be used involves many considerations. The cost per unit of first quality ware should be the deciding factor. This is sometimes difficult to determine as there is no reliable basis for comparison. Some of the factors influencing selection are shown in Table VII.



Retail market innovation

features porcelain enameled appliances

a system of mass product displays which may affect appliance merchandising policies

By Gilbert C. Close • LOS ANGELES CORRESPONDENT FOR FINISH

PORCELAIN enamel . . . gleaming white miles of it! That is the first impression this writer received when he entered the new huge May Company Home Appliance Store, in Los Angeles. After studying the numerous postwar products on display, the second impression was that porcelain enamel is destined to occupy a more prominent position in the modern home than ever before.

The unique system of mass retail merchandising introduced by the store indicates a new trend that will be of great benefit to the enameling industry. Here, on a scale hitherto unattempted, enameled products are displayed at their best. Twelve kitchens complete in every detail, tastefully decorated, and with utilities connected, are open to public inspection. Furthermore, customers are invited to enter the kitchens and operate the appliances to their own satis-

faction. In addition, more than 200 items are on individual display.

A pertinent factor of interest to enamellers is that several of the kitchens deviate from the "dead white" decorative effects common in the past. One kitchen, in fact, is decorated in black. This broaches the question of color in enameled products to blend with kitchen design.

Termed by architects "the world's largest show case," the store is completely glassed in on three sides, offering maximum window display space and perfect visibility from the outside. Floor area is approximately 26,000 square feet. The interior of the store is decorated in cool grey and lime green, colors that set off to full advantage the sparkling products on display. Ceiling-flush lighting fixtures of the fluorescent type, and air conditioning incorporated in the building design are other factors

that add to customer comfort and sales appeal of the merchandise.

Enameled products for sale include stoves and refrigerators (both gas and electric), kitchen cabinets, washing machines, garbage disposal units, and sinks of many designs. More than fifty manufacturers are represented, among them twenty manufacturers of washing machines and nine refrigerator producers. As far as is known, this is the first time that retail display of so many similar products has made them available to the customer on a single sales floor. As Mr. Tom May, vice president of the company, declared before a dedication day crowd of 75,000 persons, "Our desire to create a new type of store such as this store, wherein the consumer may see side by side the merchandise made by the greatest names in home appliances and choose with confidence the particular item

wanted, is a long step in postwar merchandising."

To illustrate the above, a person interested in an electric stove may personally operate several of them, checking, for instance, the time for the cooking plates or oven to reach full heating efficiency; or he may personally check several refrigerators for quietness of operation.

Another innovation is the Contract Service Department, created so the customer can buy an entire kitchen or bathroom just as it appears in the store display, or, with the aid of consultants, select certain features of each kitchen or bathroom best suited to his individual needs. The details

of installation are handled in a single purchase. Every element of wiring, plumbing, tile setting, heating, decorating and installation are taken care of by the store.

A center of interest that attracts many is a large auditorium with comfortable seats where expert home economists show how to get the most out of appliances. Demonstrations are conducted in a model kitchen built on the stage, including proper methods of cooking, canning, and preparation of well balanced meals.

Significant from a business standpoint, the store is *not* located in a district congested with other appliance selling institutions, but is some

distance from the center of Los Angeles, near the famed "Miracle Mile" district on Wilshire Boulevard. Thus, due to the completeness of its stock, it becomes a trading center in its own right. A parking lot behind the store will accommodate 600 autos.

From the standpoint of the porcelain enameling industry, institutions such as the one described in this article may force other appliance stores to adopt similar mass product displays. The net result will be greater retail stocks of enameled products at all times. This in itself will be an advertisement for the industry that is bound to result in greater sales.



The photograph on page 26 shows an exterior view of "The World's Largest Show Case" for the display of modern appliances. Photos on this page give some idea of the extensive nature of the floor displays of major household appliances. The displays include such porcelain enameled products as stoves, refrigerators, washing machines, sinks, etc.

In addition to the open floor displays, a number of completely equipped kitchens are included in the May Company store. Here the home owner may check appliances, compare color schemes, and get ideas for complete kitchen ensembles. There is also a large auditorium, with comfortable seats, where home economists demonstrate the appliances.



Four sectional enamellers clubs

hold first fall meetings

one strictly social — one on furnace baffles — two on metal preparation

ALL four of the sectional Enamellers Clubs held their first fall meetings during the month of September. The meeting in Cleveland was strictly a social get-together.

Pacific Coast Enamellers Club

THE third meeting of the recently formed Pacific Coast Enamellers Club, representing the first meeting of the fall season, was held September 27, at Baux Restaurant, in Los Angeles. Fifty-four members attended and, according to an authentic report from Howard Burlingame, Club secretary, the group enjoyed *two inch thick "Kansas City" steaks*.

Following the dinner, R. R. Sherrill, of Ferro Enamel Corporation, presented a timely paper on "Use of Heat Baffles on Conveyor of Continuous Enameling Furnaces." The paper was of particular interest to the West Coast group due to the fact that six plants on the Coast have "high sidewall" continuous furnaces, either operating or in the process of construction. A lively round of discussion followed Sherrill's paper.

In his talk, Sherrill referred to a failure of hot-zone bottom piers in a new continuous enameling furnace after three months of operation on porcelain enameling of stove parts. The emergency demanded a quick search for the cause in order that

(See report on page 51, October finish.) Meetings in Chicago, Philadelphia and Los Angeles included both business meetings and constructive programs.

necessary changes in design could be incorporated during the repair period and prevent a recurrence of failure. Comparison of operating characteristics with those of other furnaces of like design indicated that fuel consumption and the temperature of the burner tunnels were excessive. In turn, the excessive temperature was traceable to high radiation losses from the front opening of the furnace. Operating characteristics were brought to normal by using alloy sheet metal baffles hung on the conveyor at intervals to reduce radiation

loss. Similar baffles have been subsequently installed in other furnaces.

The paper further reported observations made and practical methods of detecting or preventing furnace failure due to excessive combustion tunnel temperatures.

Two meetings announced

The next Pacific Coast meeting will be held on Friday, December 13. (*No superstition here.*) This is scheduled as a Christmas party to which members will bring their wives and an exchange of gifts. E. M. Underwood, of Patterson Foundry and Machine Company, is the scheduled speaker. He will talk on Berylite mill linings, ball mill grinding operations, mill charges, etc.

The fifth Club meeting will be held on Friday, January 31, 1947, and "STEEL" will be the topic.

Chicago District Enamellers Club

SATURDAY, September 21, was the date of the first fall meeting of the Chicago District Enamellers Club, held at the Graemere Hotel, Chicago. Approximately 100 were in attendance to hear three speakers on the subject of "Automatic Cleaning and Pickling." The speakers were Leroy Camel, assistant sales manager, Detrex Corporation, Detroit; John Bash, president, Phillips Manufactur-

ing Company, Chicago; and Nathan Ransohoff, president of N. Ransohoff, Inc., Cincinnati.

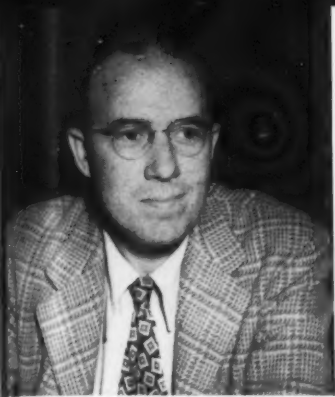
Included in the discussion were such questions as production requirements to warrant the use of automatic equipment, possibility of adapting vapor de-greasing for ceramic finishing plants, classification of types of "dirt," normally encountered, the

to Page 34 →

Program chairman, speakers and officers at the Chicago Club meeting. Left to right are: Mulvane, Bash, Camel, Ransohoff, Plankenhorn, Gerdes and Tuttle.

finishfoto





Dan Meeker, Toledo Porcelain, Central Club president.



It takes plenty of good clams for a successful clambake. There were plenty.



Deke Bond, Ferro Enamel, is Central Club secretary.

CLEVELAND

A group of Central Enamellers Club members relax following a strenuous golf game.



finishfotos

PHILADELPHIA



Wm. Clarke, Metalwash Machinery, illustrates a point in his talk.



Howard Williams, Pemco, new Club secretary, takes a note from Ed Mackasek, of the PEI.



Bill Harrison, Bureau of Sids., is attentive during meeting.

C. V. Hill's Tom Moran enjoys a smoke.



Joe Boehler, enamel plant supt. at Murray Corporation, Scranton, Pa.



Miller Company's enamel plant superintendent, P. K. Bennett.

THE 8th Annual Porcelain Enamel Institute Forum for plant men was held at the University of Illinois on October 9, 10, and 11. The 1946 meeting was termed by many the most successful of the Forums yet held. As has been true for every Forum except one, the weather was perfect; the arrangements for food and lodging were exceptional under the present overcrowded conditions characteristic of every university town; attendance of well over two hundred enamel plant men was considered good; and the program was well organized and the subjects well chosen.

Both R. H. Turk, Institute president, and Edward Mackasek, managing director, gave much credit to Professor A. I. Andrews, Head of the Department of Ceramic Engineering, U. of I., and F. A. Petersen, Special Research Associate Professor, U. of I., for the local planning which resulted in the smooth functioning of the entire program.

Following registration on Wednesday, there was an address of welcome by Dr. Coleman R. Griffith, Provost, University of Illinois, and a response by President Turk, of the P.E.I.

According to Dr. Griffith, the University now has 18,500 students in "a plant built for 12,500." Eleven thousand of these are veterans who, according to Dr. Griffith, "are here to stay — they are enthusiastic students who want to get what they missed in the Army and get it in a hurry."

Said President Turk, "Industry, too, is taxed to meet demands of production. We need the new men and need them badly."

Professor Andrews, who presided over the Wednesday session, explained that the Ceramic School, fortunately, is not crowded beyond a point of efficient operation.

Metal preparation featured

Wednesday's formal program consisted of a symposium on equipment for cleaning and pickling. Papers were presented by W. N. Noble, Ferro Enamel Corporation, and R. D. Evans, Chicago Vitreous Enamel Product Co. The papers outlined in

detail the necessary steps in the preparation of metal for porcelain enameling and listed and described all important items of equipment. Included in the discussion were various types of automatic pickling equipment, water softening equipment, solution filters, etc.

Lindbergh of Federal Electric, Ir-

greasing for special problems, the use of oiled sheets from the mill, production and cost factors, and bright annealing.

Welding, good housekeeping and safety discussed*

"Three Methods of Gaseous Shielded Arc Welding," "The Value of



win of Clyde Porcelain Steel, Boehler of Murray Corporation, Duvall of Chicago Vitreous, McIlheny of Ferro, Chrisman of Horton Mfg., Willis of Pemco, Bennett of the U. of I., Higgins of A. O. Smith, Cook of O. Hommel, Clay of Roberts and Mander, Coffeen of Metal & Thermit, and McIntyre of Ferro were among those participating in a full hour of spirited discussion which followed the presentation of the formal papers. Subjects included the placing of coils in cleaner tanks, possibilities for the use of a centrifuge and filters, problems of sludge from pigmented compounds, effects of varying degrees of hardness in water, spray pickling vs. "dunking," adaptability of vapor de-

Good Housekeeping," and "Safety in the Enamel Plant" were the three subjects ably covered in Thursday morning's session by L. G. Pickhaver, General Electric Company; J. S. LeMunyon, Tappan Stove Company; and E. H. Madden, American Associated Companies, respectively. Presiding was Dr. E. E. Marbaker, O. Hommel Company.

Mr. Pickhaver's presentation covered atomic hydrogen, helium and argon welding, and included an interesting sound film in color.

Mr. LeMunyon described the methods employed at Tappan Stove Company to keep the enameling plant clean and orderly at all times, and the effect of this program on produc-

INSTITUTE FORUM

Plant held at University of Illinois

tion, accident rate and labor turnover. The plan includes a Plant Orderliness Committee, the purpose of which is to supplement the plant orderliness program by providing opportunity for employees' participation in planning, grading and enforcement of the program.

Following are a few of the advan-

vent or eliminate carelessness." Step one is the obvious — providing proper safeguards for all equipment. Step two is an educational or "selling" program. The first step proves management's interest in the employees' safety. Prove interest in their welfare and you will get their cooperation. Psychology plays an important part



tages for which partial or complete credit is given the good housekeeping program: Accident rate reduced by 50%, loss and waste reduced by 47%, absenteeism cut over 50%, reclaiming approximately 80% cover coat enamels, and a production of 50,000 square feet of fired ware in a plant planned and laid out for 25,000 square feet per day.

Mr. Madden traced 80% of all plant accidents to carelessness of employees, 17% to management carelessness, and 3% to "acts of God" or unforeseen accidents. Said he, "Responsibility for the first two classifications, or 97% of the accidents, is on the shoulders of management if it does not take proper steps to pre-

vent or eliminate carelessness."

Tests and test methods

a controversial subject

W. N. Harrison, National Bureau of Standards, presided at Thursday afternoon's session, at which Dwight G. Moore, of the Bureau; F. A. Petersen, of the U. of I.; and A. C. Francisco, P.E.I. Research Fellow at the Bureau of Standards, spoke.

In his paper on "Research Tests and Test Methods," Mr. Moore gave an illustrated presentation covering the following tests: reflectance, acid resistance, abrasion, resistance to gouging, impact resistance, torsion, and weathering. He explained the interferograph, newly developed

equipment for testing thermal expansion of enamels. While similar to the interferometer, it records findings on a photographic negative, eliminating visual determinations. He also described the statiflux method for determining submicroscopic defects.

Professor Petersen outlined three requirements for a practical test for shop use: 1. The test must be simple in operation; 2. Equipment must be relatively inexpensive; and, 3. Equipment must be rugged.

As examples of the latter, he mentioned a type of thickness gauge and reflectometer which are now in common use in enameling plants. Said he, "Any operation in the plant can be improved by improving control methods . . . Records must be kept of correct data on shop tests to make them of value . . . Every plant, however small, must have a process control program." His discussion included tests for bond, enamel thickness, reflectance, gloss, and scratch resistance.

Conveyors, enamel firing and de-enameling

Friday morning's program included "Use of Portable Conveyors," a paper by C. P. Kumler, Mathews Conveyor Co., and presented by H. E. Helling, of the same company; "Firing Ground Coats and Cover Coats Together," by J. T. Irwin, Clyde Porcelain Steel Corp.; and "De-Enameling," by Dr. G. H. Spencer-Strong, Pemco Corporation. Wayne Duvall, Chicago Vitreous Enamel Product Co., presided.

Mr. Helling outlined the possibilities for utilizing portable conveyors in enameling plants that are not conveyorized, or as auxiliary equipment in conveyorized plants.

Mr. Irwin detailed the problems and requirements incident to the firing of ground coat and cover coat enamels on the same furnace chain (same time and temperature). This procedure is becoming increasingly common throughout the industry.

In his paper on de-enameling, Dr. Spencer-Strong raised two questions. First, "Is de-enameling worth while?" and, second, "What are the most sat-

isfactory methods?" It was determined that de-enameling is worth while in the case of complicated and expensive pieces. Such methods as molten caustic, boiling caustic, acids and sand blasting were discussed. Sand blasting was given No. 1 rating where practicable.

Decorative processes, reclaiming enamels, & non-enameling sheets

Clark Hutchison, of Ingram-Richardson Mfg. Company of Indiana, presided at Friday afternoon's session, which included the following papers: "Decorative Processes for Porcelain Enamel," by H. D. Carter, H. Draker and B. W. King, all of Harshaw Chemical Co. (presented by Mr. Draker); "New Angles on Reclaimed Enamels," by B. J. Sweo, Ferro Enamel Corp.; and a "Symposium on Porcelain Enameling Non-Enameling Sheets," by Wayne Deringer, A. O. Smith Corp.; George Wiese, Florence Stove Co.; and D. S. Beal, The Youngstown Sheet & Tube Co.

Mr. Draker described the various types of colors required for stenciling, process colors, decals, graining, printing and screen process. He outlined the firing stability of each and offered specific suggestions concerning their use.

Mr. Sweo stressed the importance of reclaiming due to the fact that as much as 50% of the enamel used is lost as overspray. He described methods, including resmelting, remilling, blunging, etc. He offered a flow sheet to show proper methods of cleaning and preparing reclaim, and suggested methods for using the enamel.

Mr. Deringer had a highly technical presentation illustrated with photomicrographs. He covered in detail the various defects that may be expected when enameling non-enameling sheets, and offered specific suggestions to correct them or minimize their effect. Included were suggestions on warpage, surface defects, pickling procedure, enameling clays and atmospheric controlled firing.

Mr. Beal explained that while some steel suppliers are producing as much enameling iron as pre-war, the demand still far exceeds rate of production. As a result of work under

way at present, future enameling sheets may be made by different methods than heretofore. He covered the subject of warping, nickel dip, wide range ground coats, and suggested the pre-sampling by the enameling department of all steel shipments under present conditions.

Mr. Wiese covered the practical problems encountered in the use of various types of steel, including cold rolled and hot rolled-pickled, received from varied sources and in quantities making isolation impractical. Pickling received much attention, as did the proper balancing of ground coat combinations.

Weaver is dinner speaker

The principal social event of the Forum was a dinner at the Urbana-Lincoln Hotel on Thursday evening, with R. H. Turk, Pemco Corp., and Institute president, as toastmaster, and R. A. Weaver, Ferro Enamel Corporation's president, as featured speaker.

Among the guests was Mr. B. B.

Kent, of B. B. Kent, Ltd., London, England, a visitor at the Forum. On his trip to the U. S., Mr. Kent had supper in Ireland, breakfast in Newfoundland, and luncheon in New York. Enamellers in England are plagued with similar problems of steel and labor shortages as those in the United States, according to the visitor.

In a strictly extemporaneous and informal talk, "Bob" Weaver pulled from his grab bag of ideas constructive suggestions for engineers and plant men. He outlined the terrific need for good, straight-thinking engineers, and urged greater "team work" in business. "Where management is not too far from the workers there is team work and successful organization." He urged engineers, plant men and executives alike to take greater interest in community work and politics. In quoting, he said, "There are only two kinds of government—a government as master of the people, or people as mas-

to Page 46 →



"Hey, Night Clerk! Have you got anything for a seasick Ceramic Engineer?"

The Washington round-up

By Wilfrid Redmond

THE national economy is bursting at the seams, *CPA reports*. Production of basic materials was at near capacity levels during August, income payments were at an annual rate of \$170 billion — \$6 billion over the wartime peak in the spring of 1945 — and non-agricultural employment was up 640,000 to reach an all-time high of 48.8 million.

CPA estimates that the current flow of goods to consumers is probably greater than at any other time in the history of the country.

The pipelines are filling up, although inventories are still low in relation to sales. Inventories have topped the \$30 billion mark for the first time. In July, manufacturers' stocks rose from \$17.2 to \$18.0 billion — wholesalers' stocks from \$4.5 to \$4.6 billion — and retailers' from \$7.1 to \$7.5 billion.

Following is the consumer goods scoreboard for August and July:

	SHIPMENTS	
	August	July
Washing machines	212,000	187,000
Refrigerators	218,000	220,000
Electric ranges	66,000	57,000
Gas ranges	169,000	127,000
	PRODUCTION	
	August	July
Bathtubs	104,000	82,000
Sinks	221,000	163,000

CC ratings have been granted for the fourth quarter to producers of bathtubs, sinks, and lavatories to enable them to obtain steel and pig iron.

NHA established a subsidy of \$8 a ton for production of merchant pig iron by furnaces now in operation. About 32 furnaces are eligible. A subsidy of \$12 will be allowed to producers to re-open closed down furnaces. About six are eligible. The first of these is expected to start production between November 1 and 15.

Steel shortage continues

Although general steel production is climbing, there is an acute shortage of such products as sheet and strip, small bars, and tin mill products. A shortage in sheet and strip of 13 per cent is estimated in the fourth quarter, including a 15 per

cent shortage in hot rolled, and a 9 per cent deficit in cold rolled. Preliminary estimates for 1947 indicates a continuation of the shortage in overall steel supply, again particularly in sheet and strip products.

Lead consumption in the fourth quarter has been cut to 212,500 tons from 225,000 tons in the third quarter. Some products will receive a reduced allocation, notably replacement batteries. The lead stockpile is down to 38,000 tons, the point beyond which no withdrawals will be made except for national emergencies involving health and safety.

OPA reverses itself

OPA has reversed itself on a ruling of August 15 in which major appliance resellers were declared ineligible to have their prewar margins restored as provided in the Crawford amendment of the Price Control Extension Act. Refrigerators are particularly affected by the revocation of the interpretation of August 15. Resellers of appliances who have been required by OPA to absorb price increases at the manufacturer level, are now permitted under a new ruling of Richard Field, General Counsel of the Price Agency, to resume their prewar markups.

The Crawford amendment, authored by Representative Fred Crawford, of Michigan, provides that prewar markups are to be allowed to certain retail and wholesale industries, the principal sales of which consisted during the calendar years 1939 to 1941, inclusive, of sales of a commodity, the production or retail distribution of which has been reduced for a period of three years beginning on or after March 2, 1942, by 75 per cent or more below such production or retail distribution for the calendar years 1939 to 1941.

This provision for prewar markups applies, however, only for a certain period — until the unit sales of the particular commodity for a period of six months reach the annual sales for

the calendar years 1939 to 1941, inclusive.

The amendment does not apply to washing machines, for instance, because unit sales have already reached the 1939 to 1941 level for the required six months period. However, resellers of washing machines may pass on any increase in manufacturers' prices which has been permitted by OPA after March 31, 1946, under the Wherry amendment.

Mr. Field reversed the OPA ruling of August 15 after representative Crawford had protested that the price agency was not following the intent of the amendment. OPA had stated in a press release that sales of major appliances do not make up the principal sales volume of the retail industries which sell these products.

The OPA General Counsel wrote to Representative Crawford:

"I have gone into the matter thoroughly and I agree with you that this interpretation is not in full accord with the Congressional intention of assisting the retail industry which specializes in the sale of a commodity or commodities that had been largely forced out of production or retail distribution by wartime government restrictions."

According to Mr. Field, only mechanical refrigerators and automobiles have not reached the prewar sales level for a six month period. Resellers of these commodities are, therefore, now entitled to their prewar markups.

Some industries foresee an unbalanced sales structure in our normal economy which may result from an inclination on the part of retail industries to retain the markup ratios in effect when price controls are removed rather than to return to the historical levels.

Soda ash priority granted alumina manufacturer

The soda ash supply situation has been made more critical by Henry Kaiser who has called upon CPA to issue him a CC rating for this material under a provision of PR-28 which requires the agency to give such priority assistance in order to

to Page 50 →

→ from Page 28

use of power spray washers, etc. All speakers stressed the necessity of proper *engineering* for all pickle room or pickle machine installations, regardless of size or individual requirements.

Said Mr. Bash, "The type of metal cleaning and the system to be used, and all the other factors involved, should be carefully gone into in detail with the plant engineer and the metal cleaning engineer. The metal cleaning engineer should be told the type of soil he is going to have to remove. He in turn will work with the plant engineer to develop the most efficient, the most economical type of metal cleaning machines, be it what it may. In other words, if you take the metal cleaning problem and engineer it correctly, as you would any other engineering problem in your plant, you will insure yourself of the most efficient and economical installation, to say nothing of lost sleep saved by the entire engineering department and production executives."

Nathan Ransohoff, in his talk, explained the principles of conveyor-

ized or "automatic" pickling equipment, time cycles, etc.

Leroy Camel showed a series of interesting slides to illustrate his description of the various types of cleaners and their function.

President Plankenhorn announced that a dinner meeting of the Coordinating Committee, representing all four active Enamelers Clubs, would be held the first evening of the Porcelain Enamel Institute Forum in Urbana. He also announced the date of the next Chicago Club meeting as November 30.

Dwight Bennett, University of Illinois; Russell Hartwig, Benjamin Electric Mfg. Co.; and Levant Huyck, Huyck Construction Co., were appointed as nominating committee to start work on a slate for the next annual election.

Evidence that the membership committee, consisting of Marcel Pouilly, American Stove Company, chairman, and George Sirovy, Jr., Century Vitreous Enamel Company, have been active is presented in the latest total paid membership — 150. This sets a new record for active membership in the Club.

Eastern District Enamelers Club

OVER seventy-five representatives of the enameling industry in the East met on the Supper Club floor of the Ritz Carlton Hotel, Philadelphia, at 1:00 P.M. on Saturday, September 23, to enjoy an excellent chicken luncheon and the afternoon meeting of the Eastern Club. In the absence of Nathan Klein, Club president, Fred Campbell, Club vice president, acted as chairman of the meeting.

The business meeting was brief, consisting principally of the election of Howard N. Williams, Pemco Corporation, as secretary of the Club to fill the unexpired term of J. L. Lardusky.

Two featured speakers were Wm. W. Clarke, of Metalwash Machinery Co., whose subject was "Continuous Spray Equipment as Applied to Cleaning and Pickling for Porcelain Enameling," and Edward Mackasek, Porcelain Enamel Institute managing director, whose subject was "The

Future of Porcelain Enameling."

An adaptation of Mr. Clarke's paper appears in this issue of *finish*.

Ed Mackasek, in his talk, summarized developments in the enameling industry and showed the possible ef-

fects on current production and future markets for porcelain enamel of government control, high labor costs, fixed price levels, etc. Said he, "The principle of competition is the lifeblood of every business. All human progress is dependent on the character of *leadership*. This is true both of individual businesses and of whole industries . . . This industry has been blessed with splendid leaders. An unusually high percentage of its executives are men of far-reaching vision — but — in the next few years we face a period of transition during which the leadership will pass to the *rising generation*. The successors must have the capacity for wise guidance."

In closing, Mr. Mackasek pointed to the need for additional fundamental research, outlined some of the progress related to materials and equipment which will help the industry forge ahead, and ended on a note of optimism by referring to new and expanding outlets for the product.

The next meeting of the Eastern Club will be held on November 23, again at the Ritz Carlton Hotel. Speakers will be Herman Cook, O. Hommel Company; Dr. G. H. Spencer-Strong, Pemco Corp.; and R. R. Danielson, Metal & Thermit Corp.

Mr. Danielson will report to the Club on "The Proceedings at the P.E.I. Forum." Subjects of the other two speakers have not yet been announced.

This photograph shows the Eastern Enamelers "getting set" for the business meeting program.



finishfoto

American Gas Association

holds 28th annual convention at Atlantic City

first postwar exhibit of gas appliances and industry products

THE first postwar exhibition of gas appliances and equipment occupied 56,000 square feet of space in the Atlantic City Auditorium for the display of the most modern means for the utilization of gas for the home and for industry. This exhibit formed an important part of the 28th Annual Convention of the American Gas Association which opened in Atlantic City with an early registration of 7,000, and a total attendance goal of 10,000.

Many subjects covered in program

The convention program, designed to cover every important phase of gas industry activity, included authoritative speakers on a wide range of subjects—employee relations, financial and material prospects of the industry, government and business, public opinion polls, business economics, human and public relations, research and selling.

Among the nationally known speakers scheduled were J. A. Krug, Elmo Roper, Wm. Bodine, Arthur Motley, K. H. Pratt, E. V. Murphee, Robert Gerholz and Everett J. Boothby, AGA president.

AGA-GAMA relations stressed in president's address

The following are bits from Mr. Boothby's address: "This year, the first time since 1941, members of the gas industry find it possible to meet in a convention of this magnitude, to review the industry's accomplishments and to set our sights on the future. . . .

"Instead of the unprecedented production that was visualized in our country, we are beset on all sides with shortages, which bid fair to undermine our whole economy as the result of maladjusted states of mind of individuals and in the inflation which now is upon us. These shortages in most instances are caused by the continued existence of the

very controls which have in theory been imposed, and continued, to prevent such shortages. At this time we as a nation are going along under the worst condition—part of the economy still subject to governmental controls which were necessary during the war, with the remainder decontrolled. Fundamentally, except when war emergencies make it otherwise necessary, this democracy has always done its best when having the least interference from government and when there has been the least interference with the basic law of supply and demand. . . ."

Mr. Boothby pointed to changing relationships between gas appliance manufacturers and the gas utilities "largely because of the increasing extent to which dealer activities have been developed." He continued, "These relationships must be watched closely by both the utilities and the manufacturers so there will be no alienation between the two. . . ."

"Through the respective associations of the two groups, namely Gas Appliance Manufacturers Association and American Gas Association, much can and will be done. Each must chart its course to be of assistance

to the other even more than it has in the past. . . ."

"From the customer's viewpoint good gas service does not stop with the delivery of a satisfactory fuel to the appliance. It includes the performance of the appliance in utilizing that fuel. We can not be indifferent to our obligation to contribute what we can toward the customer obtaining the best in gas service. On the other hand, we in the utilities should also face the situation squarely. There is no doubt that every change we call for, different from the manufacturers' standards, costs the manufacturers money, is bound to cost us and our customers money and makes for confusion both to the manufacturers and ourselves.

"The manufacturers are to be congratulated individually and as a group for the extent to which they have gone, against many difficulties, in providing their exhibits here at this Convention, the first such magnificent exhibit in a full decade.

Natural gas reserves estimated at 148 trillion cubic feet

The AGA Committee on Natural
to Page 46 →



55 YEARS OF PROGRESS

- PORCELAIN ENAMEL FRIT
- ENAMELING OXIDES
- GLASS COLORS
- PASTE BURNISH & LIQUID GOLD
- GLAZE STAINS
- O. G. & U. G. COLORS
- CERAMIC CHEMICALS
- SPRAYING MACHINES
- DECORATING SUPPLIES
- OHCO ENAMELING CLAYS
- OHCO PORCELAIN BALLS & BRICKS
- POTTERY FRIT

These and many other "Quality First" Hommel materials are available for immediate delivery. They have performance qualifications that only 55 years of continuous ceramic experience can give.

New developments are "Stock-In-Trade". Hommel modern methods plus modern equipment and research equals modern ceramic materials

A Leader in the Ceramic Industry

TITE-WITE . . a name to remember, a frit of many uses

REGISTERED



Laboratory Controlled Production of Ceramic Supplies

O. HOMMEL CO.

PITTSBURGH 30, PENNA.

Pacific Coast Agents
L. H. BUTCHER CO.

World's Most Complete Ceramic Supplier

- FRIT for Steel, Cast Iron or Pottery
- CERAMIC COLORS
- BRONZE POWDERS
- SUPPLIES
- CHEMICALS
- METAL POWDERS
- EQUIPMENT

Our Technical Staff and Samples are available to you without obligation. Let us help you with your problems.

NEWS

V. A. Barker's Possible Enamel Company's importance the addition of Charles H. Barker to the organization. (Note: Barker is not a name to be used in this article.)

Wheeler returns to Tam

"Dan" Wheeler, who until recently was associated with Ervite Corporation, Erie, Pennsylvania, has rejoined the Titanium Alloy Manufacturing Company organization with headquarters in New York City.

Says Dan, "Anyone who knows of an available home in New York City, please note and advise."

R&M control man

John A. Gustitus is now control man on the "B" shift in Roberts & Mander Corporation's enameling plant. Gustitus has a B.S. degree in chemistry, and prior to joining the R & M organization was with Bethlehem Steel Company and E. G. Budd.

Schell joins Ing-Rich of Indiana

Announcement was received from Ingram-Richardson Manufacturing Co., of Indiana, Frankfort, that Donald C. Schell recently joined the ceramic engineering staff of the company.

Schell was graduated from the ceramic engineering school of the University of Illinois in June, 1946. He attended Wright Junior College and Purdue University before entering the U. of I.

Holloway to Ferro

According to an announcement by C. D. Clawson, vice president of Ferro Enamel Corporation, A. J. (Bert) Holloway, formerly enameling technician at Cribben & Sexton Company, has joined the Ferro organization. Holloway will be permanently

located in Chicago, working under Jerry Hofstetter in that territory.

New factory manager at McCray



Announcement was made recently that Wallace R. Howard has been appointed factory manager at the McCray Refrigerator Company plant, in Kendallville, Indiana.

Howard took over his new duties with McCray in September. He went to Kendallville from Connersville, Indiana, where he was associated with the Rex Manufacturing Company for sixteen years. His most recent job with Rex was assistant factory manager.

Advancements in Cribben & Sexton enameling department

Larry Wikes has been chosen general foreman to succeed Oscar Colletti, who left this position in August of this year. Wikes went to Cribben & Sexton in 1929 from the American

Gas Machine Company. He was engaged in various enamel department operations until 1943, when he was appointed assistant general foreman in the enameling plant.

Ben Gillette has recently been transferred to the enamel shop control department as enameling technician. Gillette left the production department of International Harvester Company in 1941 to join Cribben & Sexton. During the past five years he has been located in the engineering department where his principal duties consisted of inspecting and testing enamel for endurance and appearance.

Officers at Polar Ware Company

It was recently announced that Andrew J. Vollrath has resigned as secretary of the Polar Ware Company. Present officers of the company are the following: W. J. Vollrath, Sr., president; Jacob J. Vollrath, Sr., vice president; W. J. Vollrath, Jr., secretary; Richard J. Vollrath, treasurer; and Jacob J. Vollrath, Jr., assistant secretary.

A. K. Paeschke to head GP&F



new president

August K. Paeschke, veteran of World War II, was elected president of Geuder, Paeschke & Frey Company, Milwaukee, at a recent meeting of the Board of Directors. He succeeds Henry F. Millmann, who was named chairman of the board.

Frank T. Frey and Alfred J. Lehmkuhl will continue in their present capacities as vice president and treas-

urer, and secretary and assistant treasurer, respectively, as will Carl H. Voss, vice president, and Herbert N. Forsberg, vice president.

Other new officers are Curt E. Hoerig, former assistant works manager, who was elected vice president,



chairman of the board

and Lloyd R. Mueller, former division sales manager, who was appointed vice president.

August K. Paeschke, the new company president, is the third generation of his family to serve in this capacity. His grandfather, Charles A. Paeschke, a co-founder of the firm, was president of the company from 1903 until 1935, while his father, the late Charles W. Paeschke, was president from 1936 until his death in 1938.

Both Frank T. Frey and Curt E. Hoerig are also grandsons of the co-founders, Frank J. Frey, and William A. Geuder, respectively. Mr. Geuder was the first president of the business upon its incorporation in 1888 until 1903.

Ervite promotes Dale

R. S. Dale, formerly plant engineer at Ervite Corporation, Erie, Pennsylvania, was recently promoted to the position of plant manager.

ACS Trenton Section active

The first fall meeting of the Trenton Section of the American Ceramic Society was held Friday night, September 27, at the Stacy-Trent Hotel. Over 100 members and guests were

in attendance as Chairman Leonard Hepner opened the meeting.

Guest speaker of the evening was Dr. R. M. Burns, of The Bell Telephone Company, whose topic was "Ceramics in Communications." Assisted by his associates, Dr. Burns illustrated his discussion with some elaborate equipment developed by his company.

As this issue of *finish* goes to press, the Section will be holding its October meeting, with Samuel G. Hibben, director of applied lighting, Westinghouse Electric Corporation, Bloomfield, N.J., as the featured speaker. His topic is "New Methods of Producing Light."

A.C.S. Chicago Section meeting

The Chicago Section of the American Ceramic Society met for its first fall meeting on October 4. The meeting was a particularly lively and interesting one, for the subject was "Ceramic's Role in the Housing Program."

Speakers for the evening were: John T. Holsman, architect, of Holsman, Holsman and Klekamp, Chicago, Illinois; Myron Hultmark, Besser Mfg. Co., Alpena, Michigan; and Max L. Kuehnert, Region 5, Structural Clay Products Institute.

In speaking to ceramic manufacturers, Mr. Holsman said new products and even improved old ones should be developed with four objectives in mind: 1. Cost of the product; 2. Cost of the product in place; 3. Cost of trimming material; and 4. Cost of maintenance. This offers a good check list for those who are developing porcelain enameled products for architectural use.

A.C.S. Pittsburgh section meeting

The Pittsburgh Section of the American Ceramic Society held its first technical meeting of the fall season in Mellon Institute Auditorium on Monday, October 7, at 8:15 P.M.

Dr. Frank W. Preston, head of Preston Laboratories, Butler, Pa., presented a very vivid account of his trip to Bikini last July to observe the second atom bomb test.

November meeting

The Pittsburgh Section will observe its annual Penn State Night, Tuesday, November 12, at Mellon Institute. Dr. E. F. Osborn, head of the Department of Earth Sciences of Pennsylvania State College, will speak on "Recent Advances in Geochemistry as Related to Ceramics."



Featured speakers at the October meeting of the Chicago District Enamellers Club were John M. Bash, Phillips Manufacturing Company; Leroy Camel, Detrex Corporation; and Nathan Ransohoff, N. Ransohoff, Inc.

Moore Corporation to expand enameling facilities

Ground has been broken for an addition to the plant of the Moore Corporation, Joliet, Ill., maker of coal heaters, gas heaters and gas, coal and combination ranges which, according to announcement today by Bernard J. Hank, president of the company, is the first step in a modernization program to cost several hundred thousand dollars and require until the end of next year or early in 1943 for completion. The improvements will involve the virtual rebuilding of the factory and will increase production capacity tenfold.

The current addition will house a new pickle room for the porcelain enameling department. The room is expected to be in use by the end of this year.

Beginning within a few weeks, a seven-burner continuous porcelain enameling furnace will be installed, to supersede two box-type furnaces.

With the new furnace will be included a new cover coat dryer, with automatic spraying machine, and a new ground coat dryer. The foundry will be renovated and new labor-saving equipment installed. New machinery also will simplify and facilitate the cleaning and sandblasting of castings.

The first stages of the renovation program, which are expected to be completed by May, 1947, will increase annual production capacity from 30,000 units to 150,000 units. The company then will begin the final part of its expansion schedule. The new seven-burner porcelain enameling furnace will be enlarged successively to nine-burner and eleven-burner installations, with accompanying re-arrangement and further expansion of assembly facilities. New electrical and heating facilities also will be installed.

Holscher joins Murray Corp.



Max Holscher, formerly superintendent of the porcelain enameling plant at Seeger-Sunbeam Corporation, St. Paul, has joined the enameling division of Murray Corporation of America at their Scranton, Pennsylvania plant.

Frank Yuenger advanced at ABC

Announcement comes from Altorfer Bros. Company, Peoria, Illinois, manufacturers of ABC household appliances, that Frank Yuenger has re-

cently been advanced to the position of general foreman of the porcelain enameling department.

Porst and Stuft of Pemco receive A.S.A. award

E. G. Porst, chief chemist, and P. C. Stuft, assistant director of research, of Pemco Corporation, have received the American Standards Association award for Army and Navy equipment and procedure. A letter from Howard Cooney, chairman of the Executive Committee of A.S.A. to Karl Turk, president of Pemco, stated that simplification of products, interchangeability of repair parts, better procedures for subcontracting, higher standards of manufacture suggestions by the American Standards Association's War Committees, resulted in the saving of time, money and material, and contributed to the victory. Mr. Cooney further stated that A. S. A. War Committees had been singly honored by the Army and Navy, and that they were eager to pass this honor along to the men who actually did the work. Among the Standards Association war projects were standard quality

controls, specifications for machine tools, electrical and photographic equipment, and simplified designs for military equipment.

Dr. Tooley to U. of I.



Dr. Fay Va Nisle Tooley has joined the staff of the Department of Ceramic Engineering at the University of Illinois as Professor of Glass Technology. He will organize and direct a new and expanded program of instruction and research in this important phase of ceramics.

Dr. Tooley received the Ph. D. in Ceramic Engineering in 1939. From 1939 until his present appointment, Dr. Tooley has been with the Owens-Corning Fiberglas Corporation as head of the Glass Research Department at their laboratory and plant at Newark, Ohio. He has directed the activities of a staff of forty-two people working on glass research, development and control. It is suggested that his wide experience in glass batch formulations may prove helpful to other divisions of the Ceramic Department.

ICHAM meets in Cincinnati December 2, 3 & 4

It is expected that keen interest will be shown by the manufacturers of cooking and heating appliances in the 14th Annual Convention of the Institute to be held at the Netherland Plaza Hotel on December 2, 3 and 4. Fosskett Brown, president of Gray and Dudley Company, Nash-

.....

GOOD PACKING

now has a

NEW IMPORTANCE

.....

Good packing is always important as a part of good merchandising. Today, when every manufacturer of finished products needs more boxes and crates than he can get, good packing takes on a new importance.

Finished products are in short supply too, and every product must reach its destination in perfect condition. That's why we urge you to remember these three points:

1. Our company is doing everything within its power to get packing materials to you as fast as possible.
2. Every Chicago Mill and Lumber customer is getting his fair share of our total production.
3. We are still maintaining the quality and workmanship that our customers have learned to expect.

It is the duty of our plants to get as much material to you as possible, and it is the duty of our engineers to see that your product is *fully* protected. We respect this responsibility, and are doing everything humanly possible to keep your products moving, and moving safely.

Your sincere co-operation is greatly appreciated.

CHICAGO MILL AND LUMBER COMPANY

33 South Clark Street

Chicago 3, Illinois

Pioneers for Over 60 Years

Plants at: Helena, Ark. • Greenville, Miss. • Tallulah, La. • Chicago, Ill. • Plymouth, N. C.

ville, Tenn., is convention chairman. Institute executives promise an unparalleled opportunity for an interchange of ideas on production, distribution, labor relations and pricing.

Stove production may drop for the remainder of this year, according to an official spokesman for the Institute, unless unforeseen relief is extended to the industry in obtaining materials. This is in contrast to the fact that stove production has made steady gains through August of this year. Present inventories of steel, pig iron and castings are said to have reached critically low levels. Production outlook in the steel industry will be one point for full consideration by the group.

The manufacturers' exhibit will include producing companies furnishing a wide variety of materials, services and components to the cooking and heating appliance industry. According to the October announcement of space reservations, there will be at least three exhibitors featuring porcelain enamel—the Porcelain Enamel Institute, Ferro Enamel Corporation, and O. Hommel Company. Indicative of the wide variety of

products that will be on exhibit are the following, representing widely divergent fields: American Rolling Mill Co. (*steel*); Verson Allsteel Press Co. (*fabricating equipment*); New Monarch Machine & Stamping Co. (*stamping service*); Chicago Mill & Lumber Co. (*shipping containers*); and Robertshaw Thermostat Co. (*controls*).

Divisions of the ICHAM consist of five product groups. Groups and their respective chairmen are as follows: Electric Ranges—A. K. Walton, vice president, Newark Stove Co.; Gas Appliances—S. C. Bernhardt, vice president, Grand Home Appliance Co.; Kerosene Stoves—W. C. Davis, vice president, United Stove Co.; Oil Division—A. T. Atwill, president, Quaker Mfg. Co.; and Solid Fuels—R. H. Spake, president, Comstock-Castle Stove Co.

Electric range and kerosene stove divisions will hold their annual meetings on Monday, December 2. The gas appliances, oil, and solid fuels divisions will meet on Wednesday, December 4.

Heavy attendance is predicted for this year's meeting.

costs are lower than in the U.S.

Gas water heater exteriors are porcelain enameled in England. According to Mr. Kent, exterior shells on instantaneous gas water heaters—"geysers"—must be porcelain enameled to be acceptable to the English trade. Gas storage water heaters also have porcelain enameled exteriors.

Architectural porcelain enamel has not yet come into its own. A few installations were made prior to the war in the North of England, in locations where atmospheric conditions are extremely bad. These installations are said to be in excellent condition at present.

In Mr. Kent's opinion, the biggest expansion of appliances will be in the refrigerator field. Only about 5% of the population of England had any kind of refrigeration other than "cellars" prior to the war. All of the new government pre-fabricated houses have gas refrigeration, and it is expected that both gas and electric mechanical refrigerators will enjoy a greatly expanded market.

The new pre-fabricated houses have complete facilities for heating, cooking and plumbing in a single centrally located unit. Aircraft plants are being utilized for the production of these pre-fabs. Some are of aluminum, but the majority are of steel.

Our visitor stated that he expects the porcelain enameling business in England to prosper for a number of years, and indicated that there is at present at least a five-year backlog of porcelain enameling business.

Visitor describes enameling conditions in England

Mr. B. B. Kent, of B. B. Kent Ltd., London, England, was a recent visitor in the *finish* offices. Mr. Kent's company operates a four-furnace porcelain enamel jobbing plant in the heart of London. The plant was completely destroyed during the early blitz days of World War II, and present work is being done in an entirely new plant which is in the final stages of completion.

Jobbing work done by the company includes refrigerator parts, gas and electric cookers, some sign work (when steel is available), water heater parts, and the fabricating and enameling of table tops.

The plant operates on a 24-hour, 2-shift basis. The standard work week is ten hours per day, with 1½ hours off for lunch and "tea." Net work time on Saturday is 4½ hours, making a 47-hour week. In working the full 12-hour shift, as in this

plant, the workmen get time and one-sixth for all working time. An average good enameler in London gets



FINISH PHOTO

50¢ per hour. This should be qualified, of course, by the fact that, in general, living and transportation

Two new appointments for Briggs Plumbingware

Appointments of William C. Macdonald as director of sales for the Briggs Manufacturing Company's Plumbingware Division, and Lee Hopper as Macdonald's assistant, were announced recently by E. O. Brady, general manager of the Division.

Macdonald, who has been with Briggs since 1944, succeeds Brady as sales director. The latter was elevated to general manager three months ago after the death of R. B. Jenkins.

A graduate of Harvard University,

Macdonald has been in the plumbing and heating business since 1927. During the war he served with the War Production Board in Washington as chief of the war housing branch and later as deputy director of the plumbing and heating division.

Chicago Production Show announced

An attendance of 20,000 production executives, technologists, sales

managers and purchasing agents is expected at the Chicago Production Show to be held March 17, 18 and 19, 1947, in the Exhibition Hall of the Stevens Hotel. Invitations to exhibit are being mailed on October 7 to a selected list of manufacturers and suppliers of materials, equipment, tools, instruments and services, according to Paul A. Jenkins, executive secretary.

The Chicago Production Show is held each year concurrently with the

annual three-day Conference of the 48 affiliated societies, with a combined membership of 17,000 scientists, engineers and technologists. Both the Chicago District Enamellers Club and the Chicago Section of ACS are members.

National materials handling exposition to be held at Cleveland, January 14-17

The first exposition to deal entirely with industry's materials handling problem, a phase of industry which is said to represent approximately one-quarter of all costs, will be held at the Public Auditorium, Cleveland, O., January 14 through 17, 1947, it was announced by Earl I. Burke, Republic Steel Co. manager of shipping, and chairman of the packaging and loading committee of the American Iron and Steel Institute.

A four-day program of prepared papers and discussions will be held concurrently with the Exposition. This series will include materials handling specialists from the fields of ceramics, iron and steel, and foundries.

A slogan that backfired

In an unprecedented move, the 13,000-member American Society of Tool Engineers, world's largest technical organization of its kind, was forced, due to power, hotel and other strikes, to cancel its huge Semi-Annual Convention, scheduled for Pittsburgh, Pa., October 10, 11 and 12.

The theme of the Pittsburgh meeting was to have been "how to produce more goods at lower costs while paying the highest wages in the history of American manufacturing."

Plenty of natural gas

There is ample natural gas already discovered for many years to come, and with proper conservation the supply should be practically inexhaustible, Gardiner Symonds, president of the Tennessee Gas and Transmission Company, of Houston, Texas, told the Manufactured Gas Department of the American Gas Association convention on October 7.

Remember the new name **FERRO CHEMICAL CORP.** 

FLUORIDES

Now available for immediate shipment

SODIUM FLUORIDE 95%

NILE BLUE SODIUM FLUORIDE 95%

AMMONIA BIFLUORIDE

SODIUM BIFLUORIDE

Carload lots available for early delivery.

Write, wire, or telephone...

CHerry 0296

Manufacturers:

Driers for Paint and
Varnish, Printing Ink,
and Allied Industries.



W. B. Lawson
President

Distributors for:
Aluminum Ore Co.;
American Potash &
Chemical Co.; Darling
& Co.; Duquesne
Smelting Corp.; Lind-
say Light & Chemical
Co.; Merck & Co.;
Philadelphia Quartz
Co.; Stauffer Chemical
Co.; Tennessee Corp.;
Virginia Carolina
Chemical Corp.;
Wyandotte Chemicals
Corp.; and others.

FERRO CHEMICAL CORPORATION

Successor to W. B. Lawson, Inc. and Ferro Drier & Chemical Co.
(Subsidiary of Ferro Enamel Corporation)

Union Commerce Buiding

Cleveland 14, Ohio

An Invitation...

TO CUSTOMERS and PROSPECTS

You are cordially invited
...TO VISIT OUR MODERN,
WELL EQUIPPED STAMPING
AND ENAMELING PLANT...

VITREOUS STEEL PRODUCTS CO.
NAPPANEE, INDIANA

If you are a customer, come and see our plant which is really a department of your business. You should know our shop. You should be familiar with our equipment. After all, we are really on your payroll, working hard for what you pay us.

If you are looking for a source for porcelain enameling, we should like to show you our setup. You may be surprised at our very complete facilities and excellent personnel.

You will see why we have held and pleased our customers, some of whom have been on our books for over 25 years.

VITREOUS STEEL PRODUCTS CO.
BOX 1791, CLEVELAND 5, OHIO (Factory at Nappanee, Ind.)



89%
More than ~~85%~~ of all
modern PORCELAIN
ENAMELING FURNACES
have been
Built by Ferro

Just for

HERE IS A NEW
SERVED BY

†A-B Stoves, Inc.
Abendroth Bros. Company
‡Aetna Oil Burner Company
Allen Mfg. Company
†Alliance Wares, Inc., Alliance, Ohio
‡Alliance Wares, Inc., Oskaloosa, Iowa
Altorfer Bros. Company
‡American-Central Mfg. Co.
American Radiator Co.
†American Stove Co., Cleveland, Ohio
American Stove Co., Harvey, Ill.
American Stove Co., Lorain, Ohio
American Stove Co., St. Louis, Mo.
†Apex Electric Mfg. Co.
Armstrong Products Corp.

†Baltimore Porcelain Steel Corp.
W. A. Barrows Porcelain Enameling Co.
Beaver Enameling Co.
†Bellevue Porcelain Enameling Co.
Belmont Stamping & Enameling Co.
†Benjamin Electric Mfg. Co.
†Bettinger Enamel Co.
Briggs Mfg. Co.
†Bright Light Reflector Co., Inc.

†California Metal Enameling Co.
Caloric Gas Stove Works
Canton Stamping & Enameling Co.
Chambers Corp.
Chattanooga Stamping & Enameling Co.
†Clyde Porcelain Steel Corporation
‡Consolidated-Vultee Aircraft Corp.
†Co-operative Stove Co.
Cribben & Sexton Company

Davidson Enamel Products Co., Lima, O.
†Detroit-Michigan Stove Works
J. C. Dunlap Company

‡Electromaster, Inc.
The Enamel Products Co.
†Erie Enameling Company
Estate Stove Company

Federal Enameling & Stamping Co.
Federal Radio & Telegraph Co.
Ferro Enameling Co., Oakland, Calif.
Fletcher Enamel Company
Florence Stove Co., Gardner, Mass.

†Florence Stove Co., Kankakee, Ill.
†Floyd-Wells Co.
Ed. Friedrich, Inc.
Frigidaire Div., General Motors Corp.

Gaffers & Sattler Company
General Electric Co., Erie, Pa.
General Electric Co., Schenectady, N. Y.
General Porcelain Enamel & Mfg. Co.
†Geuder, Paeschke & Frey Co.
†Gibson Refrigerator Corp.
Glascote Products, Inc.
Glenwood Range Co.
†Globe-American Corp.
Goodrich Electric Co.
†Jas. Graham Mfg. Co.

C. V. Hill & Company
Humphreys Mfg. Co.
†Hussmann-Ligonier Co.

Ice Cooling Appliance Corp.
Independence Stove & Furnace Co.
†Ingram Richardson Mfg. Co.,
Frankfort, Ind.

†Jones Metal Products Co.

†Kalamazoo Stove & Furnace Co.
†Kelvinator Corporation

‡Landers, Frary & Clark Co.
†Leonard & Baker Stove Co.
‡A. J. Lindemann & Hoverson Co.
Lisk Mfg. Co.

†Marshall Stove Company
†Moore Corporation
†Moore Enameling & Mfg. Co.
†Mt. Vernon Furnace Mfg. Co.
†Mullins Mfg. Corp., Salem, O.
†Murray Corp. of America
†Murray Manufacturing Co.

‡National Enameling & Stamping Co.
†Newark Stove Co.
Norge Div., Borg-Warner Corp.,
Muskegon, Mich.
†Norge Div., Borg-Warner Corp.,
Eiffingham, Ill.
†Norris Stamping & Mfg. Co.

Ohio Foundry Company
†O'Keefe & Merritt Co.

†Peerless Enamel Products Co.
Perfection Stove Co.
Pfaudler Co., Elyria, Ohio
Pfaudler Co., Rochester, N. Y.
‡Philco Corporation
†Porcelain Metals Corporation
†Porcelain Steel Corporation
Portland Stove Fdry. Co.
‡Pressed Steel Car Company

Quality Porcelain Enamel & Mfg. Co.
Quincy Vitreous Enameling Co.

Reading Vitreous Enameling & Fdry. Co.
Rehoboth Porcelain Enamel Co.
Republic Stamping & Enameling Co.
Roberts & Mander Stove Co.
Roesch Enamel Range Co.
†Geo. D. Roper Corporation
Round Oak Stove Co.

Samuel Stamping & Enameling Co.
†Seaporcel Porcelain Metals, Inc.
Seeger-Sunbeam Corp.
Serval, Inc.
‡Smoot-Holman Company
Southern Metal Products Co.
Standard Enameling Co.
Standard Porcelain Enameling Co.
The Stove Works, Inc.
†Strong Mfg. Co.

Tappan Stove Co.
Tennessee Enamel Mfg. Co.
Tennessee Stove Works
Texlite, Inc.
A. F. Thompson Mfg. Co.,
Huntington, W. Va.
‡A. F. Thompson Mfg. Co., Tyler, Texas
Toledo Porcelain Enamel Products Co.
Tyler Fixture Corp., Niles, Mich.
†Tyler Fixture Corp., Waxahachie, Texas

U. S. Stamping Company

Vitreous Steel Products Co., Cleveland, O.
Vitreous Steel Products Co., Nappanee, Ind.
Warren Co.

New customers for whom Porcelain Enameling plants or furnaces have been built since the war.
Old customers for whom new porcelain furnaces have been built since the war.

the RECORD...

Revised * LIST OF CUSTOMERS FERRO'S ENGINEERING DIVISION

†Welbilt Stove Co.
†Western Stove Co.
†Westinghouse Elec. & Mfg. Co.
Wrought Iron Range Co.
Youngstown Pressed Steel Div.,
Mullins Mfg. Co.

LATIN AMERICA

Cia. Argentina de Productos Enlozados
y Anexos S. A.
Cia. Industrial Del Norte
F. Daroch & Cia.
Esmaltes Mexicanos S. A.
Fabrica de Enlozados S. A.
Fabrica Ferro Esmaltado Silex S. A.
Ferrilloza S. A.
Ferrosalt S. A.
Hime & Cia.
Industrial Jones De Mexico
Ind. Martins Ferreira S. A.
Industrias Reunidas S. A.
Jose Pascucci y Cia.
Juan B. Istilart, Ltda.
Manufacturas Corona S. A.
Manufacturera de Metales S. A.
Pacheco, Ltda.
C. I. Sousa Noschese S. A.
Troqueles y Esmaltes S. A.

CANADA

A. Belanger, Ltd.
Canadian General Electric Co.
Canadian Westinghouse Co., Ltd.
Dominion Rust Proof Co.,
Empire Stove & Furnace Co.
Enamel & Heating Products, Ltd.
Findlays, Ltd.
Frigidaire Products of Canada, Ltd.
General Steel Wares, Ltd.
Guelph Stove Co., Ltd.
Gurney Foundry, Ltd.
LaFonderie de L'Islet, Ltd.
Moffats, Ltd.
Vilas Enamel Products, Ltd.

SOUTH AFRICA

C. J. Fuchs, Inc.
South African General Electric Co.
The Union Enamel Co.
Vitrous Enamel Corp., Pty. Ltd.

GREAT BRITAIN

Benjamin Electric Co., Ltd.
R. & A. G. Crossland, Ltd.
Electrolux, Ltd.
Federated Foundries, Ltd.
General Electric Co.
J. & A. Jordon & Sons
R. & A. Main, Ltd.
Parkinson Stove Co., Ltd.
Pressed Steel Co.
Richmond Gas Stove Co.
Royal Ordnance Factory
Rubery, Owen Co., Ltd.
Simplex Electric Co.
Wilson & Mathieson, Ltd.

EUROPE

Aktiebolag M. Lundgrens Gjuteri
Husqvarna Vapenfabriks A. B.
Gerard-Becuwe
A. B. Gustausberg Fabriker
J. Kaliba & Sohn
Siemens-Schuckertwerke A. G.

AUSTRALASIA


Chown Bros. Pty., Ltd.
Alex. Harvey & Sons, Ltd.
Metters K. F. B. Pty., Ltd.
Mellwraith Industries, Ltd.
Claude Neon, Ltd.
Radiation (New Zealand), Ltd.
H. E. Shacklock, Ltd.
A. Simpson & Sons, Ltd.

* In the Porcelain Enameling Field ONLY . . . and for whom furnaces
or complete plants have been or are being built. See footnote above.

Since V-J Day

Porcelain enamellers have made great strides in getting back into normal production . . . and in building a bigger, stronger industry. Plants have been modernized for greater efficiency. Production facilities have been expanded. A number of new plants have been built. Ferro, through its engineering and service organizations, has played an important part in this great industrial development. Today, as for the past two decades, Ferro is headquarters for all that is new in Porcelain enameling.

FERRO ENAMEL CORPORATION
CLEVELAND 5, OHIO



A. G. A. Convention

→ from Page 35

Gas Reserves, of which N. C. McGowan, president, United Gas Corp., is chairman, reported that proved recoverable reserves of natural gas in the United States as of December 1, 1945, were approximately 148 trillion cubic feet. A committee was appointed to investigate the natural gas and natural gas liquid reserves as of December 31 each year, and to report early the following year.

Liquefied petroleum gas market

George Benz, manager of Chemical Products Dept., Phillips Petroleum Co., discussed liquefied petroleum gas, including commercial propane, commercial butane and propane-butane mixtures. "In twenty years," said Mr. Benz, "the marketed production of LPG has grown from 465,000 gallons to over one billion gallons, of which over 50% was used for domestic or household purposes in 1945 . . ." There are local

shortages in LPG in areas where requirements exceed the capacity of local refineries. There are approximately 40 recovery plants under construction or definitely planned which is estimated will add 500,000,000 gallons annually to the industry's supply.

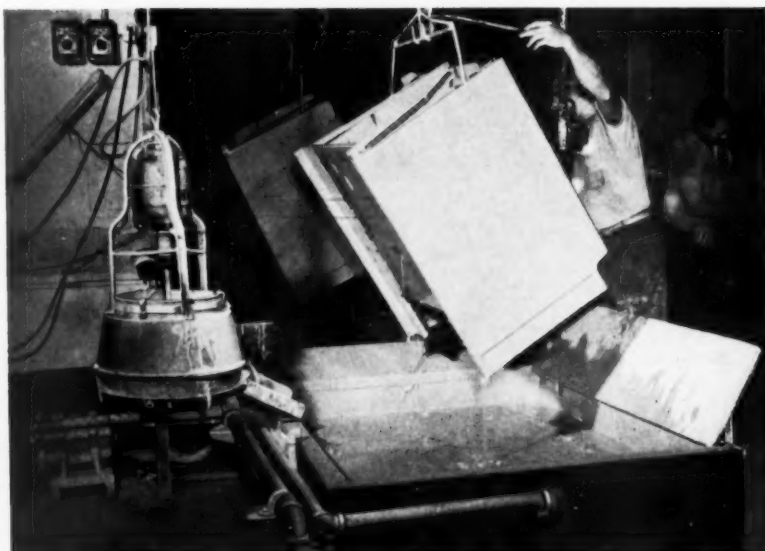
AGA officers for 1946-47

The following officers will head AGA for the coming year: President, R. H. Hargrove, vice president, United Gas Pipe Line Co.; 1st vice president, Hudson W. Reed, president, The Philadelphia Gas Works Co.; 2nd vice president, Robert W. Hendee, president, Colorado Interstate Gas Co.; and treasurer, Edward F. Barrett, president, Long Island Lighting Co.

Among the members of the Board of Directors elected for two-year terms were two representatives of appliance manufacturing companies whose nominations were presented by GAMA. They are: Lyle C. Harvey, president, Bryant Heater Co., Cleveland, Ohio; and D. P. O'Keefe, president, O'Keefe & Merritt Co., Los Angeles, Cal.

Use Rotospray

for circulating dip tanks too



INSTALLATION, EDISON GENERAL ELECTRIC APPLIANCE CO., CHICAGO, ILLINOIS

Wherever and whenever porcelain enamel slip should be sieved, Rotospraying is the answer. It's the standard method because it is the most efficient and economical method yet devised for doing the job.

If you will need sieving equipment in the future, we suggest an early order. Rotospray production is up, but there is still a waiting list.

Rotospray sifters are rugged and dependable. They do their job day in and day out, year in and year out. Many of the first installations in porcelain enameling plants are still in use helping produce better ware.

Rotospray is built in three sizes. You can get complete information by writing direct to us or to any of our authorized agents.

ROTOSPRAY

(Reg. U.S. Pat. Off.)

"Worth waiting for"

Sales representatives —
B. F. DRACKENFELD & CO., INC., New York, N.Y.
PEMCO CORPORATION, Baltimore, Md.
FERRO ENAMEL CORP., Cleveland, Ohio and foreign offices
CHICAGO VITREOUS ENAMEL PRODUCT CO., Cicero, Ill.

BRAUN CORPORATION, Los Angeles, Cal.
BRAUN KNECHT & HEIMANN CO., San Francisco, Cal.

Foreign representatives —
WATFORD ENGINEERING WORKS, Watford, England
ELOF HANSSON, Gothenburg, Sweden.

ROTOSPRAY MANUFACTURING COMPANY

562 WASHINGTON BOULEVARD • CHICAGO 6, ILLINOIS • TEL. DEArborn 7196

P. E. I. Forum (WEAVER)

→ from Page 32

ter of the government." While Mr. Weaver does not believe that we will follow the fortunes of France, he believes all of us will have to take greater interest in government if we are to have the government of our choice.

For the engineers, he believes that opportunities are greater than ever before. "There's a big chance for any one who wants to work a little harder or take a little more interest."

Next forum scheduled

for September, '47

Frank Hodek, president of General Porcelain Enameling & Mfg. Co., and his Forum Committee received much well deserved praise for the planning and work required in the development of so successful a meeting. Without the earnest efforts of this hard working committee, the Forums could not be successful.

Mr. Hodek announced that the 9th Annual Forum is to be held at Ohio State University, Columbus, Ohio, during September, 1947.

EASY TO APPLY — SPRAY LIKE PAINT



That's another good feature of KAYKOTE — it's easy to apply — just spray it like paint. But, oh, what a difference in the final finish.

After a simple baking or curing process, this low temperature ceramic coating offers a degree of protection against corrosion impossible with ordinary finishes. This patented finish is highly resistant to rust, corrosion, heat, impact, abrasion, scratch, acids and alkalis, and will withstand temperatures up to 1200° F.

If you need this kind of protection for your product, contact us at once.

- ECONOMICAL
- DURABLE
- INORGANIC

We invite metal products manufacturers to submit articles to our laboratory to be KAYKOTED and returned to them with a complete report. Laboratory samples should not be larger than 12"x12"x48".



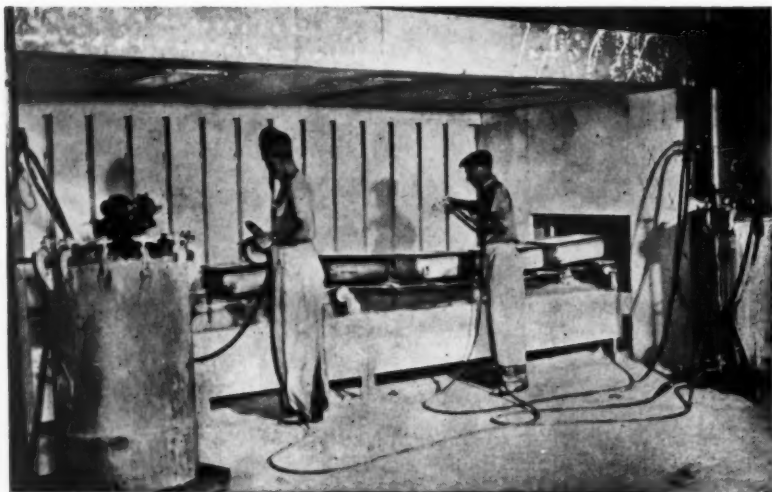
KAYKOTE DIVISION, KRAUS RESEARCH LABORATORIES, SPARKS, MD.

West Coast Distributor ... INDUSTRIAL COATINGS COMPANY • 4031 Goodwin • Los Angeles 26, California • Tel. Chapman 5-2693

QUICK TRIPS TO ENAMELING PLANTS . . .

A visit to Ingram-Richardson Mfg. Company of Indiana

(Continued from Page 19)



Top: Sink bowls are shown traveling through the cover coat spray booth on cable conveyor. The final coat is acid resisting enamel, fired separately.

Center: Loading an automatic spray machine for the application of cover coat to ground coated stove parts.

Bottom: Careful packing is an important part of sink production. Care in manufacture means little unless the finished sinks get to their destination in perfect condition.

Enamelkolor

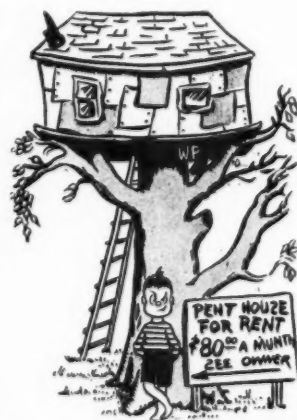


finish, except that no brushing is done on the final coat.

After final inspection, the tops and bowls are conveyed to a packing department where they are carefully packed in engineered crates and cartons. This packing is accomplished on a gravity conveyor which ends at the railroad and truck loading docks.

The sink line represents only one of the operations in this three continuous furnace plant which has for many years produced porcelain enameled table tops for cabinet and table manufacturers throughout the country, porcelain enamel frits, and fabricated and enameled stove parts for leading manufacturers.

This is the second of a series of short, short stories concerning enameling plants and enamelers.



HAND ROLLING MEANS LONGER WEAR FROM PORCELAIN GRINDING BALLS



This photo shows the extruding of the prepared body into dense columns from a de-airing machine, then the cutting to uniform lengths, and hand forming.

HAND processing in the manufacture of McDanel porcelain grinding balls is employed because it is the most effective method of getting a "close knit" structure that will not chip or crack. Every ball is then mill tested in our plant to further prove its strength.

Thousands of McDanel's mill-tested grinding balls have rolled from the production line without imperfection. Nevertheless, it is our standard practice to inspect each and every

ball individually before it is released for use.

This extra care in manufacture means added cost in our plant, but it means cost savings in every enameling plant where McDanel balls are used. It is the assurance of longer effective life that has made McDanel products the standard in so many leading plants.

The surest way to keep your mills running longer and to get uniform grinding of enamel slip is to specify McDanel mill-tested balls.

McDANEL REFRACTORY PORCELAIN CO.
BEAVER FALLS, PENNSYLVANIA

CHICAGO VITREOUS ENAMEL PRODUCT COMPANY • EXCLUSIVE REPRESENTATIVES FOR THE ENAMELING INDUSTRY.

finish NOVEMBER • 1946

Washington round-up

→ from Page 33

maintain production at a "minimum economic" rate in a plant which is manufacturing an essential product. Kaiser requested soda ash for his Permanente Alumina Plant which he leased from the War Assets Administration. CPA recently granted him the rating because aluminum is now in short supply.

The assignment of the rating is not significant in the quantity of soda ash involved, but rather because it lets down the bars on priority assistance and opens the door for other essential users to apply for an allocation. The soda ash industry, which has been rationing the limited supply on a voluntary basis, protested the assignment of a rating to Kaiser. They told CPA that Kaiser used bad judgment in not exploring the possibility of getting soda ash before he took over the Permanente plant.

CPA recently announced export quota of the principal building materials for the fourth quarter of 1946, including bathtubs, cast iron and

steel, porcelain, 5,000 each, amounting to 1.7 per cent of estimated production; and coal and wood cooking and room heating stoves, gas stoves and ranges, and kerosene cooking stoves, \$1,300,000, amounting to 2.2 per cent of estimated production.

Manufacturers exempt from "pre-ticketing"

Manufacturers of household enamelware are no longer required to pre-ticket their product with the retail price, under a recent OPA ruling. Retailers will now attach the price label and manufacturers will furnish the retail price to them in writing. The change was made when manufacturers showed conditions of manufacturing made it almost impossible to label the merchandise at the factory.

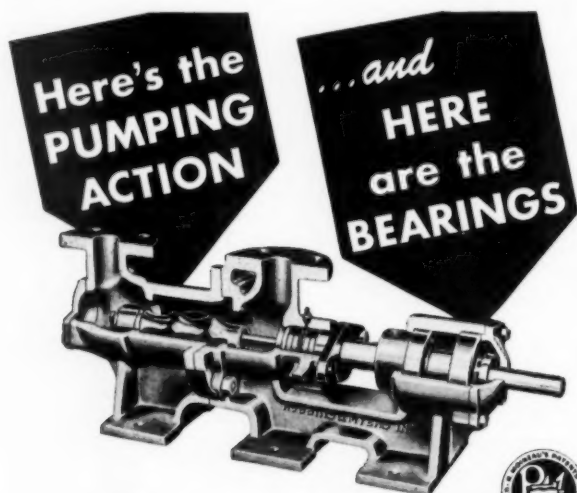
OPA also clarified several changes in the recent price order affecting enamelware. A manufacturer may include in his f.o.b. factory price a freight allowance of 50¢ per hundredweight up to that amount. In converting prices which include a

greater freight allowance, an allowance of 50¢ a hundredweight may be incorporated in the f.o.b. factory price, so that all retail ceiling prices will be figured on the same basis.

Mail order catalog prices may now be increased 5 per cent to keep them in line with prices established for other retailers.

The life expectancy of OPA is now about six months, it is believed by most Washington observers. CPA will probably pass from the scene about the same time, but CPA will go March 31, according to a statute already on the books, while OPA will be on the way as soon as Congress can get around to it after reconvening in January.

CPA Administrator John D. Small recently indicated an intention of closing down CPA earlier than provided by the law, but OWMR Director John Steelman issued a statement ordering Small to stay on the job. One of the reasons for the announcement was that CPA was rapidly disintegrating with the rumors as personnel began seeking other jobs.



NO PISTONS • NO VALVES
NO HIGH-SPEED IMPELLERS

CONTINUOUS DISCHARGE
AT POSITIVE PRESSURE

Send for this Free Book

Material Handled Can't Get into the Bearings on R & M MOYNO PUMPS

One of the many reasons why Moyno pumps stand up so well on *abrasives* is the excellent protection of bearings. Pressure can't possibly force material into the bearings, nor can lubricant work its way into the material. The two enclosures are some distance apart, and each is *independently sealed*. Moyno is the long-lived pump.

Solve Your Pumping Problems

If you use pumps, or ever expect to, you should know about the Moyno. It pumps practically everything from liquids to non-pourable pastes; passes particles; resists abrasives and chemicals; stands up where other pumps *fail*. Low internal turbulence, and the absence of flow restrictions, avoid destructive high velocities. No body casting has ever worn out. Types and sizes for every service. Thousands in use. Write for the whole story.

ROBBINS & MYERS • INC.

MOYNO PUMP DIVISION • SPRINGFIELD, OHIO
In Canada: Robbins & Myers Co. of Canada, Ltd., Brantford, Ont.

MOTORS • HOISTS • CRANES • MACHINE DRIVES • FANS • MOYNO PUMPS • FOUNDED 1878

COMPLETE *Finishing* SYSTEMS

for ENAMEL • LACQUER • PAINT



SPRAYING: Mahon Spray Booth Arrangement for painting underside of automobile bodies.



SPRAYING: Mahon Hydro-Filter Spray Booths in a typical automobile body painting production line.



DRYING AND BAKING: Typical Mahon tunnel-type drying and baking ovens for automobile bodies.



PAINT RECLAIMING: Typical Mahon overspray reclaiming system—part of a large automotive installation.



CLEANING AND RUST PROOFING

... Complete Equipment Planned Engineered, Built and Installed

When the Mahon organization contracts to supply a Complete Finishing System, it begins with a thorough study of the product to be finished, the production requirements, and the physical layout of the space available. In many instances it is more economical and desirable to build the entire finishing system, or the major part of it, outside of existing buildings—either adjacent thereto or on the roof. When these basic requirements have been established, Mahon engineers proceed to plan a Complete Finishing System that will do the particular job with utmost efficiency and economy . . . then, every unit of equipment that goes into the system is built in the Mahon plant and installed by Mahon workmen . . . the result is a thoroughly engineered and coordinated system that will produce the finest finish obtainable. If you are contemplating new equipment of this type, call in Mahon engineers . . . over twenty years of pioneering and research in this highly specialized field has endowed them with a wealth of technical knowledge and practical know-how not available to you elsewhere.

Address INDUSTRIAL EQUIPMENT DIVISION

THE R. C. MAHON COMPANY

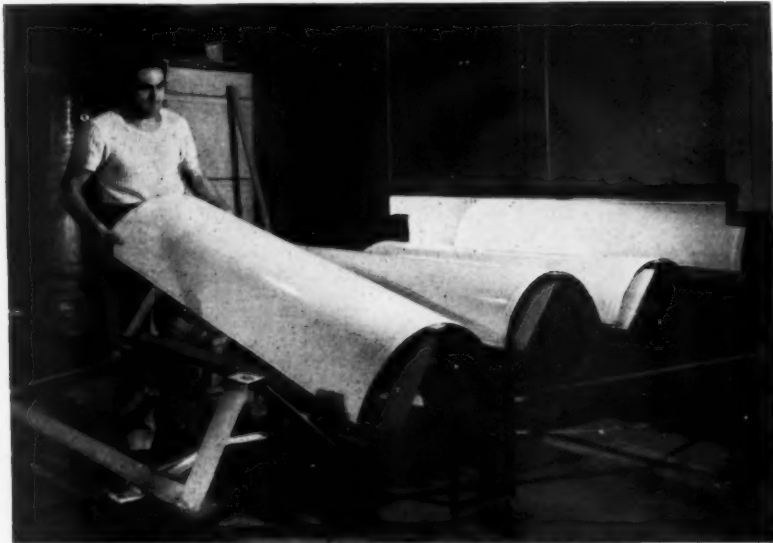
HOME OFFICE and PLANT, Detroit 11, Mich. • WESTERN SALES DIVISION, Chicago 4, Ill.

Engineers and Manufacturers of Complete Finishing Systems including: Metal Cleaning Machines, Rust-Proofing Machines, Dry-off Ovens, Hydro-Filter Spray Booths, Filtered Air Supply Units, and Drying and Baking Ovens. Also Paint Reclaiming Units, Hydro-Foam Dust Collectors, and many other Units of Production Equipment.

MAHON

This west coast plant can produce porcelain enameled water heaters in quantity

(Continued from Page 16)



Discharge side of the continuous overhead paint bake oven.

Six models of porcelain enameled automatic storage electric water heaters are produced. They employ the "strap on" type heating element. Components are a steel heater back strap 35" x 6", a layer of mica, the heating element encased in an asbestos envelope. Wire used varies as to wattage. From 35' to 50' of 14 to 24 ga. nickel-chrome wire is used per element in a flat coil assembly which must be wound carefully to prevent any stretch or change of gauge that would cause hot spots. Winding is by hand. This is a low-temperature element, running "black" only a few degrees hotter than desired water temperature, having a low-watt density so that it never glows red. More wattage is achieved merely by adding bands, controlled by separate thermostat wells, each being capable of individual removal, but all harnessed together by conduits. Differing from the submersion type element, this "strap on" is installed on the tank exterior.

Assembly operations

Tank, shell, and elements come together in main assembly in a conveyorized flow that installs base, top yoke, "strap on" elements by hook bolts, test for dielectric leaks, instal-

lation of .012 aluminum reflector sheet spaced 1 1/4" from inner tank. This latter makes the entire tank shell in reality a heating element in that a high percentage of the heat generated is reflected back to the tank surface by the aluminum sheet. The halves of the outside shells are insulated with fireproof cotton of the blanket type with tested low radiation and high insulating efficiency. These halves are mated in a base assembly, standing on dollies on the continuous

conveyor. Cotton interstices between shell flanges prevent metal-to-metal contact. Side finishing strips, a T section, with its leg going into space between halves, is hooked overtop, anchored in base holes, screwed tight into proper lock.

The insulated steel top is then pressed on, held in place by cap and yoke nut. Adjustable thermostats are installed in the wells, set in a low-medium-high arrangement to provide storage from 130° to 170° F; making possible increased quantities of hot water by dilution rather than to be limited to the fixed capacity of a single-temperated tank. Thermostat knobs are recessed. The Fowler "porcelained" water heater assembly is then complete, ready for shipment.

A number of original developments were noticed — products of company tool design and making. As Paul L. Fowler remarked: "We have always had to relieve difficulties on the fly." No tooling problem appears to stump them. Examples are the hydraulically operated prestretching machine that plays such an important part in conditioning the enameling steel for inside porcelain enameling, the hydraulic press that installs the tank heads, and a wire cutting machine that works off an adjustable drive to any desired length.

I was also much impressed with an original machine tool develop-
to Page 56 →

Crated water heaters, ready for shipment, show method of packing.





**Use the right
FOUNDATION
for durability**

PERMANENT bridges require a strong, structurally sound foundation. Permanent porcelain enamel finishes require "the right foundation" too, and that means the right ground coat — one that has the adherence or "grip" to insure a strong, everlasting bond between the cover coat enamel and the metal base.

Century makes cover coats too — in fact, a complete line of enamels for all production work on steel or cast iron. But we say first "start right from the steel out" by using Century ground coats, regardless of the cover coats you use. Use the ground coat enamels that are economical to buy and easy to work in the enameling plant, and that give everlasting protection to your products in the field.

Some of the country's largest production plants, and small plants too, have used many millions of pounds of Century ground coat enamels, and swear by them after years of use. New customers are just as enthusiastic. Try Century ground coats and you will be a booster too.

(Century ground coats have been a "life saver" in some plants that have been forced to use steel other than enameling sheets during the present critical steel situation.)



CENTURY VITREOUS ENAMEL COMPANY, 6641-61 S. Narragansett Ave., Chicago 38, Ill.

finish NOVEMBER • 1946

Study the cleaning job - THEN - engineer the equipment

(Continued from Page 24)

25 to 75 parts of water to one part of cleaner, forming a milky white emulsion, which is sprayed on the work as it travels through the washer. There are some of these emulsion type cleaners which passivate the metal if a plain water rinse is not used as the last stage, and, therefore, the metal will not rust immediately.

The use of chlorinated hydro-carbon solvents for metal cleaning was extensively developed in Europe before it was first introduced in this country in about 1925. Since that time this method of cleaning, which is usually called vapor degreasing, has been continually improved upon and is well established with a satisfactory and effective solution for many metal cleaning problems.

The vapor degreaser operates on the principle of suspending the cold metal object to be cleaned in the hot heavy vapor of the chlorinated hydro-carbon solvent used. This vapor is obtained by maintaining the solvent at its boiling point. A lower temperature of the work causes the vapor to condense on the work, again forming a liquid which dissolves the oil and greases which are soluble in this liquid and removes them as the condensed solvent runs off of the work and drips back to the liquid solvent boiling in the tank below. The slow rate of the condensation over the work is not fast enough to flush off all solid particles of dirt, lime, pigment, lint, metal particles and so forth, which are not soluble soil. Therefore, it is sometimes necessary to first dip or spray the metal being cleaned with the liquid solvent and then put the work in the vapor which acts as a rinsing and drying operation.

This type of cleaning is not enough where a chemically clean surface is required. As mentioned before, where vitreous enameling is the next step, then the part, after the removal from the degreaser, must be treated in an electrolytic cleaner giving a chemically clean surface.

Solvent degreasers are definitely

well adapted to the cleaning of small metal objects with rolled edges, seam pockets and the like which can be placed in the most advantageous position for draining but which are very difficult to rinse, drain or dry of water solution.

Floor space is very often the deciding factor as to whether a power spray washer or a chlorinated hydro-carbon solvent degreaser will be used. The average power spray washer, having two or three or four stages, comprised of the wash, rinse or a wash, rinse and dry or any of the other many combinations will take up anywhere from 25 to 60 feet of floor space. The automatic conveyORIZED vapor degreaser, capable of turning out somewhere in the neighborhood of a like amount of tonnage, can save approximately half of that amount of floor space.

Generally speaking, when comparing the power spray washer with a vapor degreaser, we will find that the initial cost of the power spray washer is two or three times as much as a vapor degreaser. There are certain engineering "musts" in the design of a power spray washer. These

"musts" should definitely be checked into before the purchase of this type of machine is made. Pump pressure and gallons per minute required must be carefully determined. Separate valves should be provided for each pump outlet so that when adjusted correctly motor and pump operate at rated capacity. Another convenient feature is separate valves so that the side sprays of a machine can be shut off providing greater volume for your top and bottom sprays, where this type of cleaning action might be desirable.

Large cleanout doors should be provided at the bottom of the washer and the bottom in turn sloped toward the cleanout door and sewer drain. An additional cleaning feature can be the installation of a pressure pipe. This pipe should be installed in the bottom of the tank on the high side and can be connected on the outside of the cleaning tank to either a hot water or steam line. In this way the entire bottom of the cleaning tank can be flushed quickly and efficiently.

Engineer the job!

And now I come to what I believe to be the most important part of this little discussion. It has nothing to do explicitly with either cleaning ma-

to Page 56 →

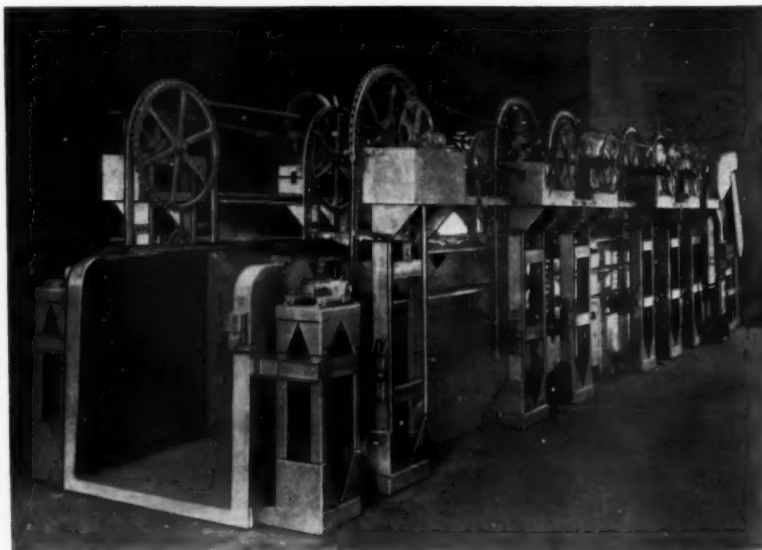


PHOTO COURTESY N. RANSOHOFF, INC.

A "grasshopper" type continuous pickling machine as discussed by Mr. Ransohoff — see page 20.



UNCHARTED SEAS OF COLOR

... now are explored for you!

Continuous color research conducted by Du Pont means that more and finer colors are ready to help win sales for you! Du Pont Color Oxides are standardized for hue, strength, purity of color and stability under repeated firing. And you'll find they add a sales punch to your products.

Come to us for help with color-selection, formulation and adoption of new procedures. Du Pont Technical Service is ready to advise on ways to help you speed production and save cost. For more information and samples, simply write: E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Department, Wilmington 98, Delaware.

Du Pont Ceramic Colors

BETTER THINGS FOR BETTER LIVING
... THROUGH CHEMISTRY



→ from Page 54

terials, cleaning methods, mechanical or otherwise. It is simply the policy that should be followed in any cleaning problems.

Metal cleaning is just as highly developed as the many other types of engineering. It should be thoroughly gone into BEFORE plant production machinery is installed or, in most cases, even purchased. The type of metal cleaning to be used, the system to be used and all the other factors involved should be carefully gone into in detail with the plant engineer

and the metal cleaning engineer. The metal cleaning engineer should be told the type of soil he is going to have to remove. He in turn will work with the plant engineer to develop the most efficient, the most economical type of metal cleaning machinery, be it what it may. In other words, if you take the metal cleaning problem and engineer it correctly, as you would any other engineering problem in your plant, you will insure the most efficient and economical installation.

horizontal plane, without any hinge action; the forming rolls move against it up and down and in and out through a spline box, ironing out the metal to the exact gauge by constant pressure. Excess metal is squeezed down into heavier gauge in the lower trim area of this flange, where it is cut off. Down-feed is by screw. A 20 T. pressure is used, with a 50 T. contrasting pressure to effect the 90° flange, drive being thus compensated to obtain constant feed without hinging variants.

This west coast plant can produce porcelain enameled water heaters in quantity

(Continued from Page 52)

ment created to flange or dish the heads for the outer shell. Using principles of the flanging machine, the pitch angle of the two forming wheels is adjustable automatically so that by varying pressure, different tempered materials can be handled to produce a true 90° flange with all spring back anticipated. Cam action

actuates a trimming device, both flange and trim being in one progressive sequence. The table is mounted on roller bearings, receives a flat disc of from 24 ga. to 12 ga. mild steel. Action is entirely mechanical. A three hp. motor provides power. Gearing is somewhat unique in that the flanging wheel is on a

The new porcelain enameled utensils you'll be buying are designed to offer homemakers the utmost in efficiency, durability, and ease in handling. The new designs will feature pots and pans with flat bottoms, smooth rims, and functional handles. These utensils will come in attractive trims to match any kitchen color scheme.

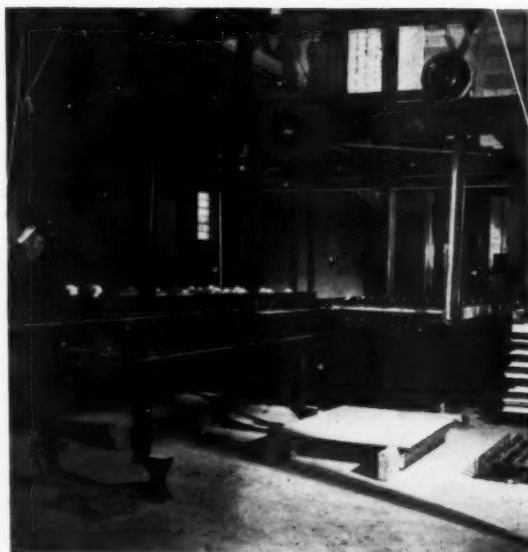
The one thing worse than a quitter is the man who is afraid to begin.

FIRING PORCELAIN ENAMEL IS EASY?

Yes, firing porcelain enamel is easy—as is every other operation in a porcelain enameling plant, if you know how.

At Lawndale, both the principals and plant operators have the know-how of successful enamel plant operation.

If you have sheet metal products that should be porcelain enameled, call us in to discuss your finishing problems *before* you place an order. Then you may expect to get the kind of finished ware you want — a lifetime finish that will sell your products and keep them sold.

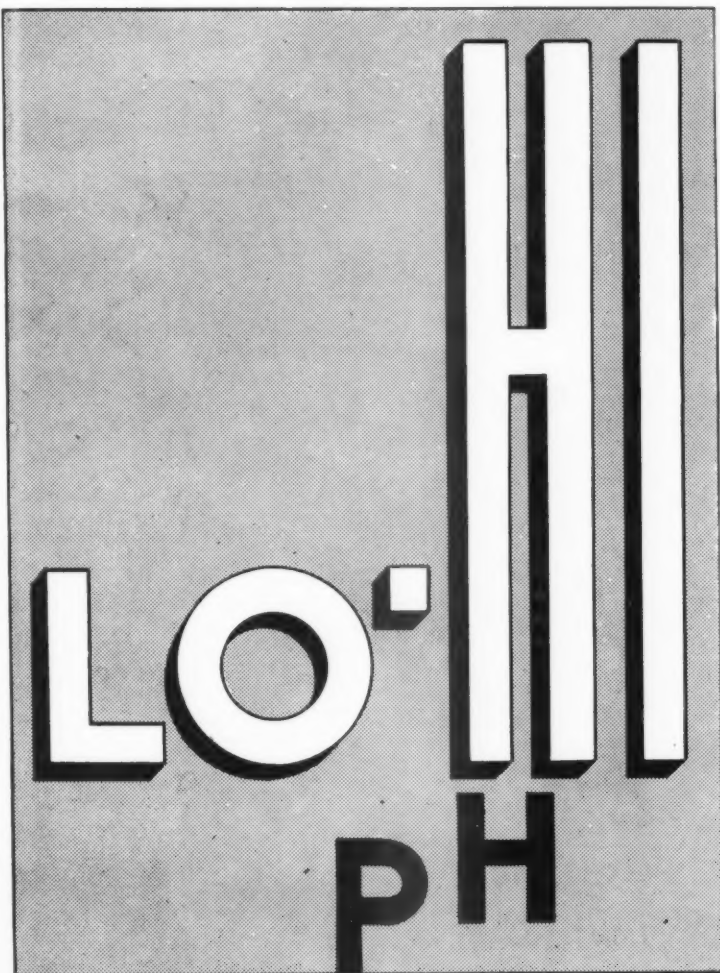


LAWNDALE ENAMELING COMPANY

• CHICAGO

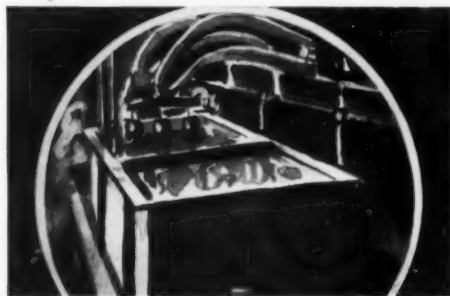
1137-1139 West 14th Street (Postal Zone 8)

• Telephone Chesepeake 5495



The WHY of "Lo-Hi"

For years this industry built only high pH or highly alkaline products. Some soil (lanolin base drawing compound for example) resisted removal. . . . As far back as 1936, we discovered that a specially compounded low pH bath, adjusted to the proper pH, would remove it readily. Actually all forms of soil (drawing, buffing, polishing, lapping, etc. compounds) can each be tabulated and speedy removal assured. . . . And so "Lo" pH teams with "Hi" pH to guarantee speedy removal of any kind of soil . . . using the "Lo-Hi" process, what the one doesn't get the other does.



NORTHWEST CHEMICAL CO.
3310 ROSELAWN DETROIT 4, MICH.



pioneers in pH cleaning control—serving you since

'32

NO NOZZLES • NO PUMPS •

**...nothing to
wear out here!**

Spray booth wear problems no longer plague the maintenance men at Geuder, Paeschke & Frey Company in Milwaukee, Wisconsin. The centrifugal water wash principle of their new DeVilbiss Ceramic Spray Booths eliminate all nozzles, pumps and piping ordinarily subjected to severe abrasive wear.

Only One Moving Part—the blower—does all the work and even its bearing is outside the

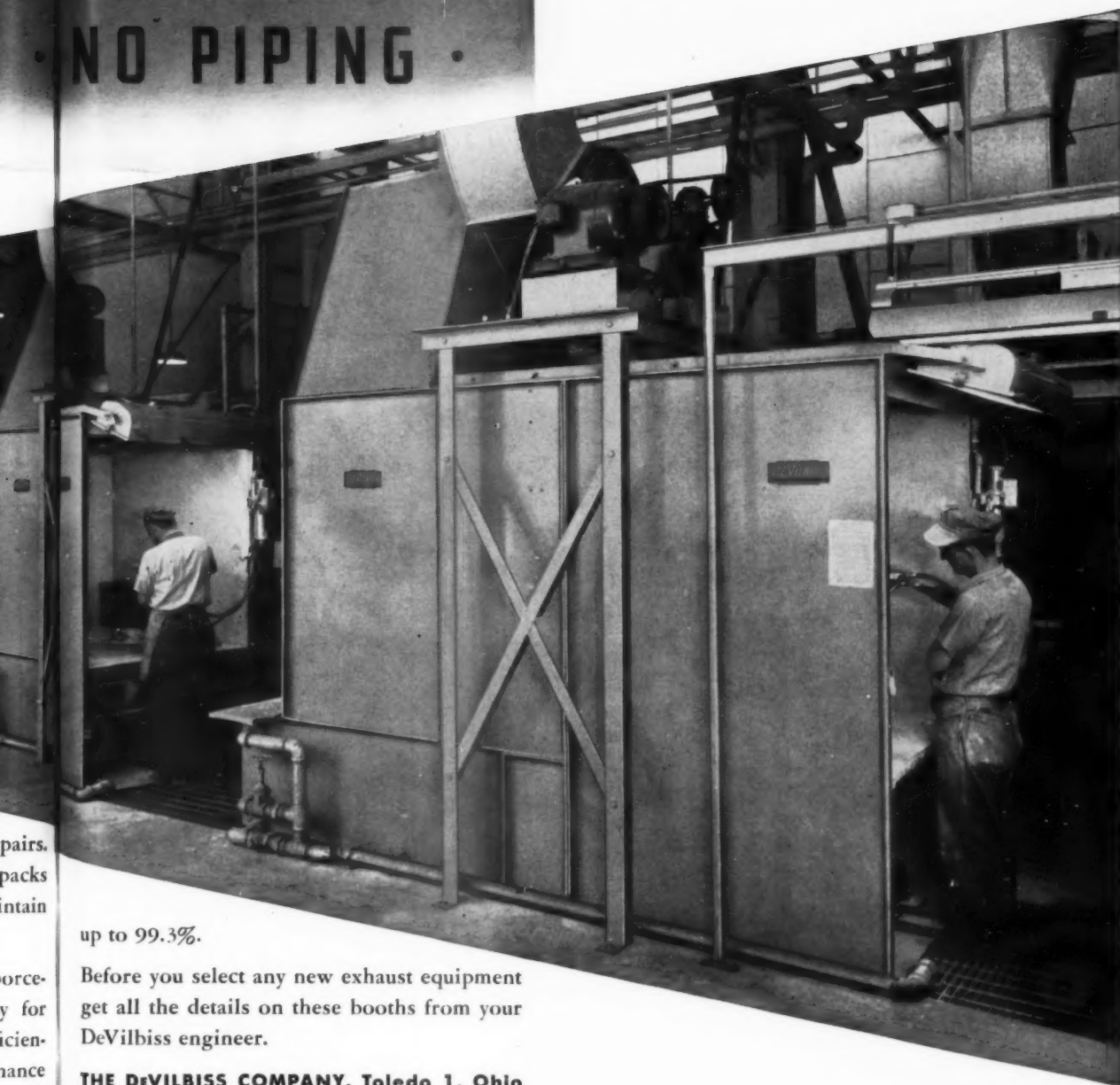
exhaust duct. No replacements—no repairs. Self-cleaning baffles replace eliminator packs which require constant cleaning to maintain exhaust efficiency.

The new DeVilbiss Spray Booths for porcelain enamel and ceramic finishing pay for themselves through high performance efficiency, low cost operation, reduced maintenance and reclamation of oversprayed material

DE VILBISS



NO PIPING.



up to 99.3%.

Before you select any new exhaust equipment get all the details on these booths from your DeVilbiss engineer.

THE DEVILBISS COMPANY, Toledo 1, Ohio

Canadian Plant: WINDSOR, ONTARIO

S means Quality in all four..



**SPRAY EQUIPMENT
EXHAUST SYSTEMS
AIR COMPRESSORS
HOSE & CONNECTIONS**